5-4610-221-34

TECHNICAL MANUAL

DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE MANUAL
WATER PURIFICATION UNIT VAN-TYPE BODY MOUNTED
ELECTRIC DRIVEN, AC, 115, 208V SINGLE AND 3 PHASE, 60 HERTZ
1/20 to 2 HP, 1500 GPH
(MET-PRO MODEL 1500-2600A)
NSN 4610-00-879-4612
(ETC MODEL S1500)
NSN 4610-01-016-9964

HEADQUARTERS, DEPARTMENT OF THE ARMY

21 DECEMBER 1979

D 101. 11:

READEX FICHE best copy available

WARNING

DANGEROUS CHEMICALS

Do not mix dry calcium hypochlorite and activated carbon together. They react violently with possible fire or explosion.

Do not pressurize the filter section until you have insured that the filter housing clamp assembly and gasket are properly seated and tightened.

Purify the best and cleanest water available. Avoid taking water near a bathing area, sewer outlet, latrine, oily area, refuse site, or camp drainage area.

Static electricity and current leakage from the electrical equipment built up in the truck and van body and can cause injury or death to personnel by shock unless proper grounding is accomplished.

Protect the eyes and skin from direct contact with chemicals and solutions. Be especially careful when opening chemical containers to avoid inhaling chemical powder.

Be careful when pouring chemical solutions into the solution tanks. Chemicals splashed on skin and eyes will cause irritation.

Accidental mixing of calcium hypochlorite and ferric chloride will produce chlorine gas.

Chlorine gas is an irritant to the respiratory tract, which can cause tracheo-bronchitis, pulmonary edema and in sufficient concentration can lead to death.

Do not mix dry calcium hypochlorite and activated carbon together. They react violently with possible fire and explosion.

Do not touch metal parts with bare hands when the temperature is extremely low.

Hydrochloric acid can cause severe skin burns and damage to eyes. Handle it with care and avoid breathing the fumes. If the solution should come into contact with the eyes or skin, rinse immediately with clear water and consult a doctor.

Be certain that the electrical supply lines are disconnected before performing any maintenance on the electrical system.

Air that is released from the pressure valve can cause serious injury to personnel if standing too close.

Thoroughly ventilate the rectifier before removal, if any of the stacks have been punctured, to prevent inhalation of poisonous fumes. Do not handle a damaged rectifier if it is hot. The poisonous selenium compound contained in the stacks can be absorbed through the skin.

Drycleaning solvent, P-D-680, used for cleaning is POTENTIALLY DANGEROUS CHEMICAL. Do not use near open flame. Flash point of solvent is 100 degrees F - 138 degrees F (38 degrees C - 59 degrees C).

Operation of this equipment presents a NOISE HAZARD to personnel in the area. The noise level exceeds the allowable limits for unprotected personnel. Wear ear muffs or earplugs which were fitted by a trained professional.

Be certain all personnel are clear before starting accessible rotating/moving mechanical components. Remain clear of these components while unit is in operation. Be particularly careful when working around the erdlator agitator drive.

CAUTION

Water Purification Equipment Set Turn-In

Opened or broken packages of chemicals (i.e., ferric-chloride and calcium hypochlorite) are highly caustic and during extended periods of storage can have a harmful effect on the interior surface of the van body and its components.

When turning in a Water Purification Equipment Set as unserviceable or excess, the following actions will be taken:

All partially consumed or opened chemicals will be utilized and/or destroyed locally.

All unopened chemicals will be **individually** packaged and **will not be stored** for shipment inside of th
water purification unit van body.

TECHNICAL MANUAL

No. 5-4610-221-34

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., 21 December 1979

DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE MANUAL WATER PURIFICATION UNIT VAN-TYPE BODY MOUNTED ELECTRIC DRIVEN, AC, 115, 208V, SINGLE AND 3 PHASE, 60 HERTZ 1/20 TO 2 HP, 1500 GPH

(MET-PRO MODEL 1500-2600A)

NSN 4610-00-879-4612

(ETC MODEL S1500)

NSN 4610-01-016-9964

REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

You can help improve this manual. If you find any mistake or if you know of a way to improve the procedures, please let us know. Mail your letter, DA Form 2028 (Recommended Changes to Publications and Blank Forms), or DA Form 2028-2 located in the back of this manual direct to: Commander, U.S. Army Troop Support and Aviation Materiel Readiness Command, ATTN: DRSTS-MTPS, 4300 Goodfellow Blvd., St. Louis, MO 63120. A reply will be furnished directly to you.

TABLE OF CONTENTS

		Paragraph	Page
CHAPTER 1.	INTRODUCTION		
Section I.	GENERAL		
	Scope	1-1	1-1
	Maintenance Forms and Records	1-2	1-1
	Reporting Equipment Improvement Recommendations (EIR)	1-3	1-1
	Destruction of Materiel to Prevent Enemy Use	1-4	1-1
Section II.	DESCRIPTION AND DATA		
	Description	1-5	1-3
	Tabulated Data	1-6	1-8
	Repair and Replacement Standards	1-7	1-15
	Differences in Models	1-8	1-15
CHAPTER 2.	MAINTENANCE INSTRUCTIONS		
Section I.	REPAIR PARTS, SPECIAL TOOLS, AND EQUIPMENT		
	Special Tools and Equipment	2-1	2-1
	Repair Parts	2-2	2-1
	Fabricated Tools and Equipment	2-3	2-1

Paragraph Page

Section II. TROUBLESHOOTING

General 2-4 2-1
Troubleshooting 2-5 2-1

Section III. GENERAL MAINTENANCE

General 2-6 2-1
Maintenance Procedures 2-7 2-1

CHAPTER 3. REPAIR INSTRUCTIONS
Section I. FRAME

Leveling Jacks 3-1 3-1

Section II. ELECTRIC MOTORS (OTHER THAN ENGINE ACCESSORIES)

Filter Pump Motor 3-2 3-2
Magnetic Motor Starters 3-3 3-3

Section III. ELECTRICAL EQUIPMENT

Stepdown Power Transformer 3-4 3-8
Electrical Control Panel Cabinet 3-5 3-10
Terminal Board Assembly 3-6 3-16
Wiring 3-7 3-18

Section IV. WATER PURIFICATION

Chemical Slurry Feeder Assembly 3-8 3-18
Chemical Solution Feeder Assembly 3-9 3-34
Slurry Feeder Frame 3-10 3-43
Influent and Effluent Launders 3-11 3-49
Three-Way Plug Valve (Filtered Water) 3-12 3-62
Flow Control Valve 3-13 3-65
Three-Way Plug Valve (Coagulated Water) 3-14 3-67
Air Release Valve 3-15 3-71
Erdlator Drive Shaft, Disk, Hub, and Bushing 3-16 3-76
Erdlator Agitator Gear Assembly 3-17 3-79
Downcomer Tube 3-18 3-81

Section V. PUMPS (EXCLUDING ENGINE PUMPS)

Filter Pump Assembly 3-19 3-82

Section VI. FIREFIGHTING EQUIPMENT

Fire Extinguisher 3-20 3-86

Section VII. ACCESSORY ITEMS

Personnel Heater 3-21 3-87
APPENDIX A. REFERENCES A-1
B. REPAIR PARTS AND SPECIAL TOOLS LIST B-1
C. EXPENDABLE SUPPLIES AND MATERIALS LIST C-1

LIST OF ILLUSTRATIONS

Figure Title Page
1-1 Placement of Demolition Charges 1-3
1-2 Water Purification Unit Mounted on Van Body, Right Rear View 1-4
1-3 Water Purification Unit Mounted on Van Body, Left Side View 1-5
1-4 Chemical Feed Equipment 1-6
1-5 Cross Section of the Erdlator Assembly 1-7
1-6 Identification Plates List 1-9

Figure	Title	Page
1-7	Shipping Dimensions	1-18
3-1	Leveling Jack, Exploded View	3-2
3-2	Filter Pump Motor Assembly, Exploded View	3-4
3-3	Motor Starter, Removal	3-6
3-4	Motor Starter, Exploded View	3-7
3-5	Stepdown Transformer, Removal	3-9
3-6	Fuse, Fuseholder, and Terminal Block, Removal	3-11
3-7	Start and Stop Pushbuttons, Removal	3-12
3-8	Start and Stop Contact Blocks, Removal	3-13
3-9	Circuit Breaker, Removal	3-14
3-10	Control Cabinet, Removal	3-15
3-11	Terminal Board Assembly, Removal	3-17
3-12	Chain Guard, Removal	3-19
3-13	Drive Chain, Removal	3-20
3-14	Slip Clutch Assembly, Removal	3-22
3-15	Slip Clutch Assembly, Exploded View (MET-PRO Model 1500-2600A)	3-23
3-16	Slip Clutch Assembly, Exploded View (ETC Model S1500)	3-24
3-17	Ejector, Removal	3-25
3-18	Diatomite Dilution Tank, Removal	3-26
3-19	Slurry Feeder Assembly, Removal	3-27
3-20	Slurry Feeder Assembly, Exploded View	3-28
3-21	Slurry Feeder Agitator, Removal	3-29
3-22	Arm Assemblies, Exploded View	3-31
3-23	Slurry Feeder Shaft and Bearings, Exploded View	3-32
3-24	Chemical Solution Feeder Assembly, Removal	3-35
3-25	Twist Lock Receptacle Connectors	3-36
3-26	Chemical Solution Feeder Assembly, Exploded View	3-37
3-27	Chemical Solution Feeder Gear Box, Exploded View	3-39
3-28	Chemical Solution Feeder, Exploded View	3-40
3-29	Chemical Solution Tanks, Removal	3-44
3-30	Belt Guard, Removal	3-45
3-31	V-Belt, Removal	3-46
3-32	Slurry Feeder Gear Assembly, Exploded View	3-47
3-33	Receptacle Box, Removal	3-48
3-34	Raw Water Pressure Gage and Aspirator, Removal	3-50
3-35	Agitator Drive V-Belt, Removal	3-51
3-36	Agitator Gear Assembly and Coupling, Removal	3-52
3-37	Erdlator Agitator Motor Assembly, Partially Exploded View	3-53
3-38	Agitator Motor Base, Removal	3-55
3-39	Erdlator Agitator Drive Shaft, Exploded View	3-56
3-40	Effluent Launder Leveling Rod, Removal	3-57
3-41	Effluent Launder Rubber Boot, Removal	3-58
3-42	Influent and Effluent Launders, Removal	3-59
3-43	Three-Way Plug Valve (Filtered Water) and Flow Control Valve, Removal	3-63
3-44	Three-Way Plug Valve, Exploded View	3-64
3-45	Flow Control Valve, Exploded View	3-66
3-46	Precoat Funnel, Removal	3-68
3-47	Three-Way Plug Valve (Coagulated Water), Removal (MET-PRO Model 1500-2600A)	3-69
3-48	Three-Way Plug Valve (Coagulated Water), Removal (ETC Model S1500)	3-70
3-49	Air Release Valve, Removal	3-73
3-50	Air Release Three-Way Valve, Exploded View	3-74

Figure	Title	Page
3-51	Air Release Valve, Exploded View	3-75
3-52	Agitator Shaft and Bearing Support, Removal	3-77
3-53	Agitator Shaft and Disk Assembly, Exploded View	3-78
3-54	Erdlator Agitator Gear Assembly, Exploded View	3-80
3-55	Filter Pump Electrical Cable, Removal	3-83
3-56	Filter Pump and Motor Assemblies, Removal	3-84
3-57	Filter Pump Assembly, Exploded View	3-85

LIST OF TABLES

Table	Title	Page
1-1	Component Repair and Replacement Standards	1-16
2-1	Troubleshooting	2-3

CHAPTER 1

INTRODUCTION

Section I. GENERAL

1-1. Scope.

a. These instructions cover the 1500 gallon-per-hour Met-Pro Model 1500-2600A and ETC Model S1500, van-type, body mounted, water purification units. They provide information on the maintenance of the equipment which is beyond the scope of the personnel, tools and equipment, or supplies normally available to using organizations.

b. The appendix contains a list of references. TM 5-4610-221-12 contains the maintenance allocation chart. The list of repair parts required by direct and general support maintenance facilities for support of the 1500 gallon-per-hour water purification unit is contained in TM 5-4610-221-34P.

1-2. Maintenance Forms and Records. Equipment maintenance forms and procedures for their use are contained in TM 38-750, The Army Maintenance Management System (TAMMS).

NOTE

Applicable forms, excluding Standard Form 46 (United States Government Motor Vehicles Operator's Identification Card) which is carried by the operator, shall be kept in a canvas bag mounted on the equipment.

1-3. Reporting Equipment Improvements Recommendations (EIR). EIR's can and must be submitted by anyone who is aware of an unsatisfactory condition with the equipment design or use. It is not necessary to show a new design or list a better way to perform a procedure, just simply tell why the design is unfavorable or why a procedure is difficult. EIR's may be submitted on SF368 (Quality Deficiency Report). Instructions for preparing EIR's are provided in TM 38-750, The Army Maintenance Management System (TAMMS). Mail directly to Commander, Headquarters, U.S. Army Troop Support and Aviation Materiel Readiness Command, ATTN: DRSTS-MEM, 4300 Goodfellow Blvd., St. Louis, MO 63120. A reply will be furnished to you.

1-4. Destruction of Material to Prevent Enemy Use.

a. General. When capture of the water purification units by an enemy or abandonment of it to the enemy is imminent, the responsible unit commander must make the decision either to destroy the equipment or render it inoperative. Based on this decision, orders are issued which cover the desired extent of destruction. Whatever method of demolition is employed, it is essential to destroy the vital parts of the water purification units and all corresponding repair parts.

b. Mechanical Means. Use sledge hammers, crowbars, picks, axes, or other heavy tools which may be available, together with the tools normally included with the water purification unit to demolish the following vital parts in the order of priority listed. Completion of the first five steps will render the unit inoperative. Completion of the additional steps listed will completely destroy the equipment.

(1) Erdlator tanks and filters.

(2) Instruments, controls, and valves.

(3) Truck and generator engine and accessories.

(4) Puncture the fuel tank.

(5) Slash the tires, hoses, and fabric tanks.

NOTE

The above steps are the minimum requirements for this method.

(6) Pumps and electric motors.

(7) Wiring and piping.

(8) Filter heads and filter elements.

(9) Chemical feed equipment.

(10) Cut all accessible cables, fuel, hydraulic and coolant lines.

(11) Chemical containers.

(12) Van body.

c. *Misuse.* Perform the steps listed below to make the unit inoperative.

(1) Drain the lubricant and coolant from the engine.

(2) Put sand, pulverized limestone, or ferric chloride into the truck engine and the gasoline driven pump engines.

(3) Start the engine and operate at full throttle.

(4) Start the water purification electric motors and jam the mechanism so that motors will burn out.

(5) Drop small gravel, nuts, or metal scraps into the suction side of the pumps and operate them.

d. *Explosives.* Place as many of the following charges (fig. 1-1) as the situation permits and detonate them simultaneously with detonating cord and a suitable detonator. Listed below are the vital parts in order of priority of demolition. Completion of the first five steps will render the unit inoperative. Completion of the additional steps will completely destroy the equipment.

(1) A 2 pound (0.9 kg) charge on top of the transmission case housing.

(2) A 2 pound (0.9 kg) charge as low on the left side of the engine as possible.

(3) A 1 pound (0.45 kg) charge between each filter pump and electric motor.

(4) A 2 pound (0.9 kg) charge in the erdlator assembly.

(5) A 2 pound (0.9 kg) charge in each filter. Remove one element to place this charge.

NOTE

The above charges are the minimum requirements for this method.

(6) A 2 pound (0.9 kg) charge over each set of wheels and axle.

(7) A 1 pound (0.45 kg) charge in the personnel heater. Open the access door.

(8) A 2 pound (0.9 kg) charge in the mids' of all coiled hose. Pile the fabric tanks and cove and bags of chemicals on this charge.

e. *Weapons Fire.* Fire on the unit with the heaviest weapons available. Direct fire at the pumps, erdlator assembly, and diatomite filters.

f. *Scattering and Concealment.* Remove all easily accessible vital parts such as engine accessories, electric control cabinet parts, hoses, fittings, filter elements, and tools. Scatter these parts through dense foliage, bury them in dirt and sand, or throw them into a lake, stream, or other body of water. Bags of chemicals should be broken and contents scattered on the ground or in a body of water.

g. *Burning.* Pack the fabric tanks, covers, and hose around the water purification unit. Saturate this packing with gasoline, oil, or diesel fuel and ignite it.

h. *Submersion.* Totally submerge the unit in a body of water to afford some water damage and concealment. A body of salt water will do the greatest damage to the metal parts.

i. *Training.* All operators should receive thorough training in the destruction of the truck mounted water purification unit. Simulated destruction, using all of the methods listed above, should be included in the operators training program. It must be emphasized in training that demolition operations are usually necessitated by critical situations when the time available for destruction is limited. For this reason, it is necessary that the operators be thoroughly familiar with all methods of destruction and be able to carry out demolition instructions without reference to this or any other manual.

j. *Additional Information.* For additional information on procedures for destruction of equipment to prevent enemy use, refer to TM 750-244-3.

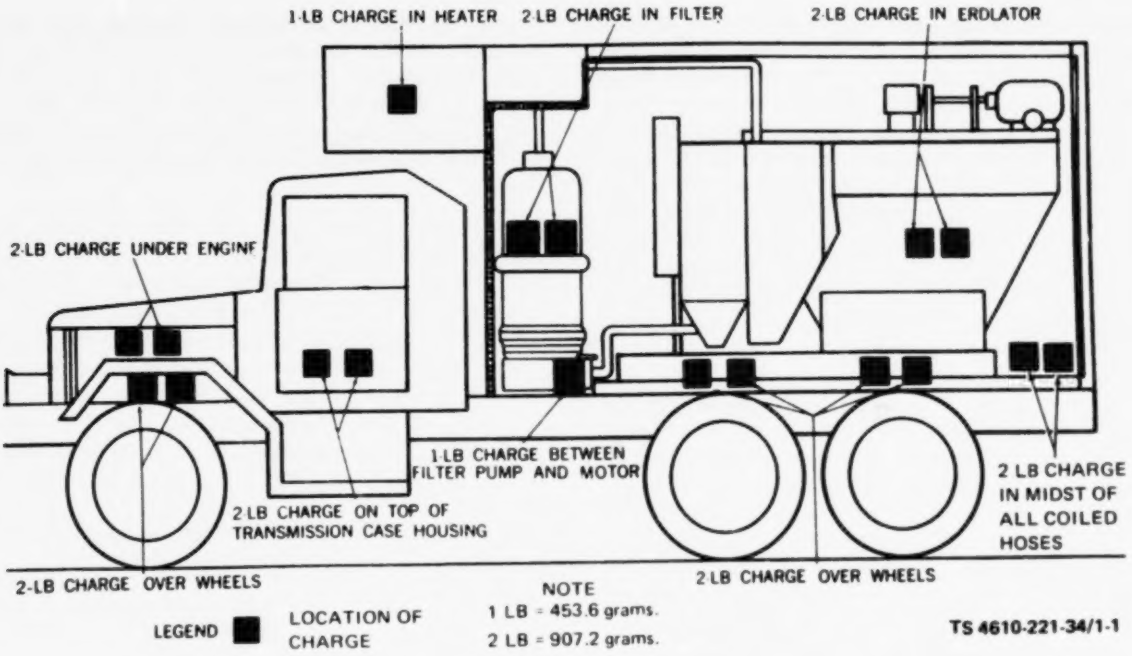

1-LB CHARGE IN HEATER
2-LB CHARGE IN FILTER
2-LB CHARGE IN ERDLATOR
2-LB CHARGE UNDER ENGINE
1-LB CHARGE BETWEEN FILTER PUMP AND MOTOR
2 LB CHARGE IN MIDST OF ALL COILED HOSES
2-LB CHARGE ON TOP OF TRANSMISSION CASE HOUSING
2-LB CHARGE OVER WHEELS
2-LB CHARGE OVER WHEELS
NOTE
1 LB = 453.6 grams.
2 LB = 907.2 grams.
LEGEND ■ LOCATION OF CHARGE
TS 4610-221-34/1-1

Figure 1-1. Placement of Demolition Charges

Section II. DESCRIPTION AND DATA

1-5. Description.

a. General. The van-type body mounted water purification unit, Met-Pro Model 1500-2600A and ETC Model, S1500, consists of water purifying equipment installed inside an insulated and heated van body (1, fig. 1-2). The water purifying equipment consists primarily of the water treatment section, where the raw water is mixed and treated with chemicals; the filter section, where the chemically treated raw water has the impurities removed; and the necessary valves, piping, and controls to direct the production of potable and palatable drinking water from fresh water at the rate of 1,500 gph (gallons-per-hour).

b. Van Body. The van body (1, fig. 1-2) has a rear door (8) and a side door (3). The rear entrance is accessible by a two-step ladder assembly (7) and the side door by a stair-type ladder assembly (2). The side door has an insulated stationary window and the window in the rear door is adjustable to permit van body ventilation. The left side doors (2, fig. 1-3) may be opened in temperate weather to be used as an operating platform. The top left side door also has an insulated stationary window. The bonnet doors (1) provide accessibility for maintenance of the personnel heater. Refer to TM 5-4610-221-12 for maintenance on the van body and to TM 5-4520-227-14 for maintenance on the personnel heater.

c. Water Treatment Section.

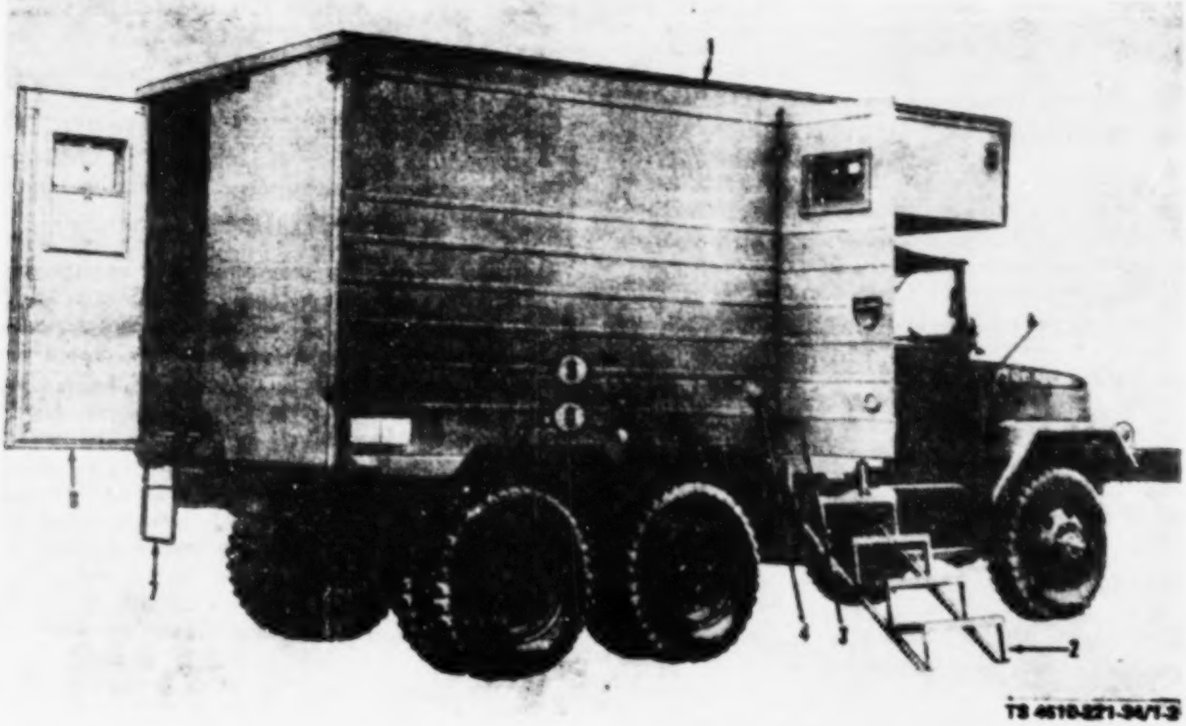
(1) Chemical feed equipment. The chemical feed equipment consists of a slurry feeder assembly (1, fig. 1-4) that has two compartments and a chemical solution feeder assembly (4, fig. 1-4). Pulverized limestone is mixed with raw water to create a limestone slurry in one compartment and diatomaceous earth and filtered water is mixed in the other compartment to create a diatomite slurry. The limestone slurry is fed to the erdlator tank (6, fig. 1-3) where it is mixed with ferric chloride and calcium hypochlorite which is supplied by the chemical solution feeder assembly (4, fig. 1-4). The diatomite slurry is fed to the diatomite tank (2) where it is diluted with coagulated water, then on to the diatomite filter assembly (3, fig. 1-3) where it coats the filter elements to act as a filtering aid. The slurry feeder assembly is electric motor driven through a slurry feeder gear assembly (3, fig. 1-4).

(2) Erdlator assembly. The erdlator assembly includes the erdlator tank (6, fig. 1-3) sludge concentrator tank (4), and wet well tank (5). The

erdlator tank is the area where raw water is first introduced through the aspirators (2, fig. 1-5) into the influent launder (1). The raw water then overflows into the mixing zone (3) of the erdlator tank where it is mixed with limestone slurry, calcium hypochlorite, ferric chloride and, when necessary, activated charcoal. The erdlator agitator (7) causes the chemically saturated raw water to rotate and flow out the bottom of the mixing zone into the clarification zone (6) of the erdlator tank. The chemically saturated water is then separated in the clarification zone of the erdlator tank and the limestone forms a slurry blanket of floc to remove suspended organic matter. The water from which the organic matter has been removed will rise above the slurry blanket and be drawn off through the effluent launder (4). The water drawn off by the effluent launder is called coagulated water. The coagulated water is piped to the wet well tank (5, fig. 1-3) which acts as a sump for the filter pump assembly (8) and provides limited storage for the coagulated water. When the slurry blanket in the erdlator tank rises too high, the excess slurry blanket is drawn off through the slurry weir box to the sludge concentrator tank (5, fig. 1-5). The sludge concentrator tank permits the slurry to further settle and the organic free water, or coagulated water, is then drawn off from the sludge concentrator tank to the wet well tank.

d. Filter Section. The filter section consists of a diatomite filter assembly (3, fig. 1-3), filter pump assembly (8), piping, and gages. The filter is designed to employ the filtration properties of diatomaceous earth to remove suspended matter from the coagulated water and is provided with an air release valve which allows the backwashing of the filter elements. The filter pump electric motor is operated from the control cabinet (7) located on the front of the sludge concentrator tank. The control cabinet also contains the controls for all of the electrical drive components and supporting equipment.

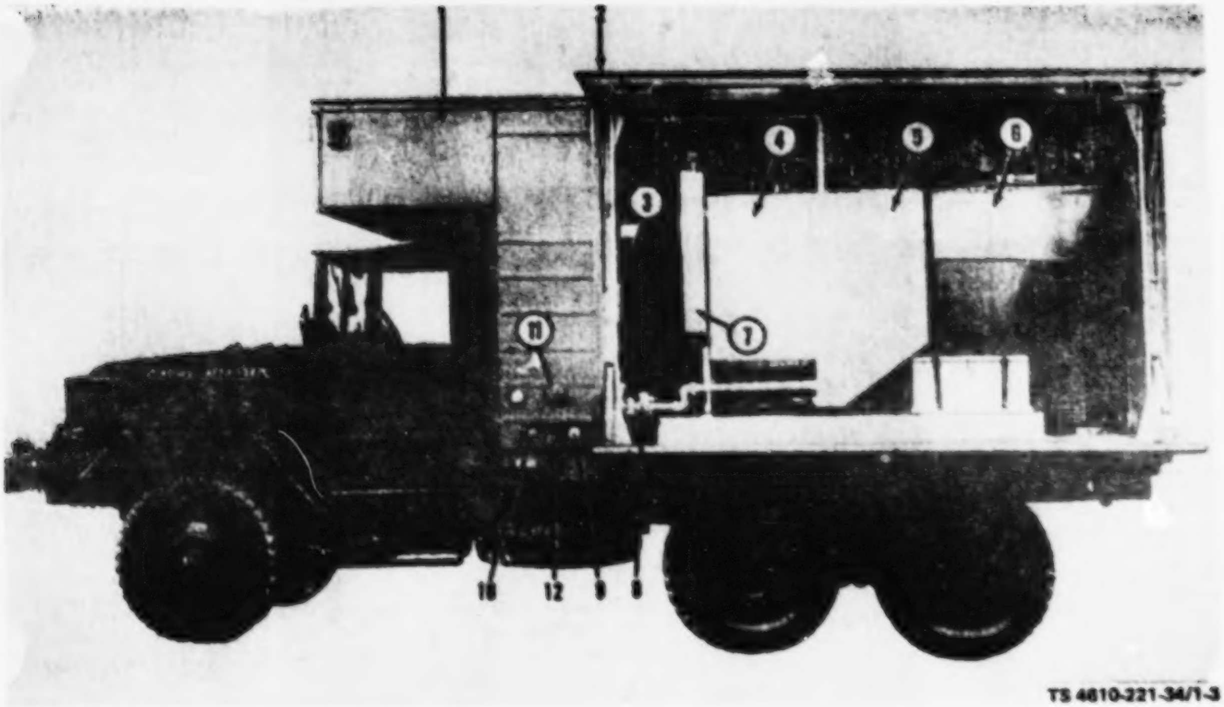
e. For further descriptive data, refer to TM 5-4610-221-12.



TS 4610-221-34/1-2

1. Van body
2. Ladder assembly
3. Right side door
4. Cable outlet cap
5. Hose cap (raw water outlet)
6. Hose cap (waste water outlet)
7. Ladder assembly
8. Rear door

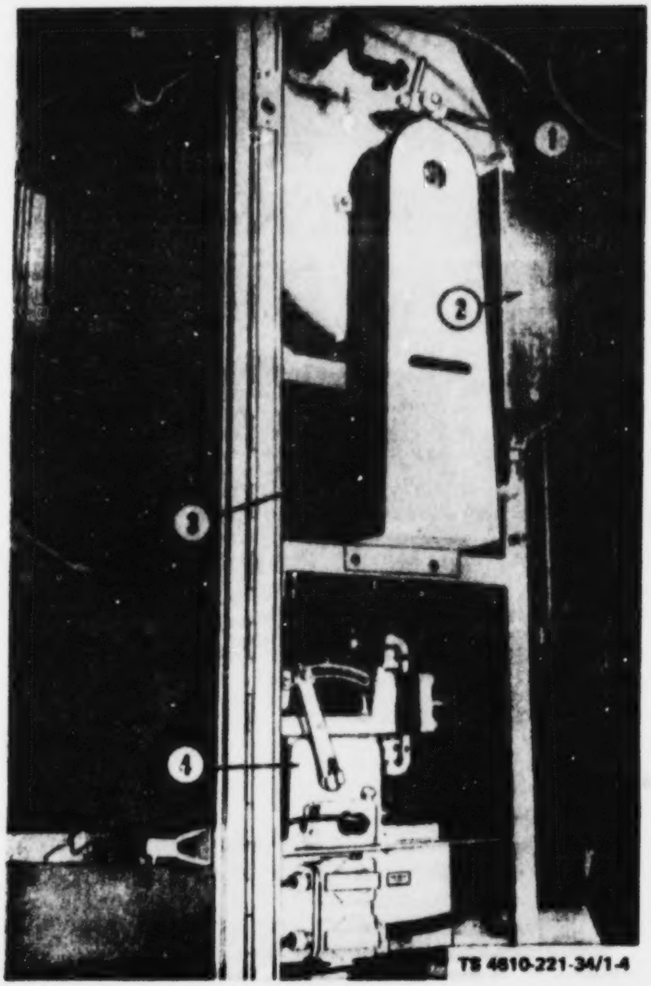
Figure 1-2. Water Purification Unit Mounted on Van Body, Right Rear View



TS 4610-221-34/1-3

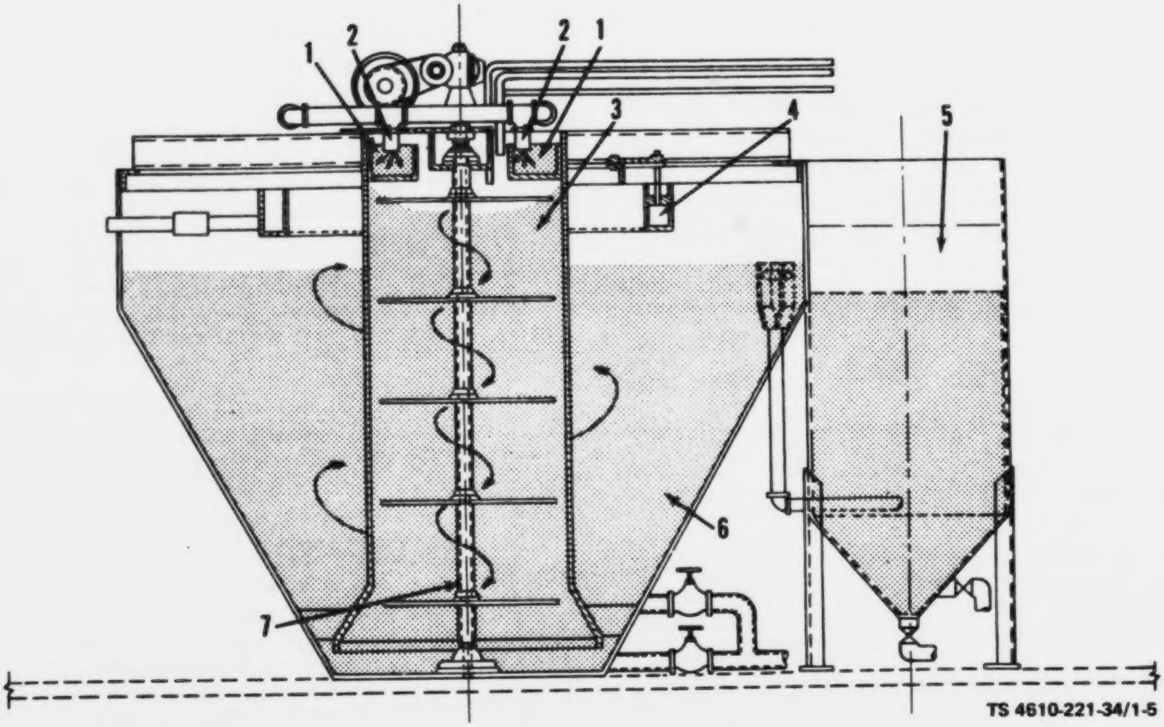
1. Bonnet door (2)
2. Left side door
3. Diatomite filter assembly
4. Sludge concentrator tank
5. Wet well tank
6. Erdlator tank
7. Control cabinet
8. Filler pump assembly
9. Hose cap (water waste outlet)
10. Hose cap (water waste outlet)
11. Cable outlet cap
12. Ground stud

Figure 1-3. Water Purification Unit Mounted on Van Body, Left Side View


1
2
3
4
TS 4610-221-34/1-4

1. Slurry feeder assembly
2. Diatomite dilution tank
3. Slurry feeder gear assembly
4. Chemical solution feeder assembly

Figure 1-4. Chemical Feed Equipment


1
2
2
1
3
4
5
6
7
TS 4610-221-34/1-5

1. Influent launder
2. Aspirator (4)
3. Mixing zone
4. Effluent launder
5. Sludge concentrator tank
6. Clarification zone
7. Erdlator agitator

Figure 1-5. Cross Section of the Erdlator Assembly.

1-6. Tabulated Data.

a. Identification.

(1) The transportation data plate (A, fig. 1-6), located on the right rear side of the van body gives the length, width, and height in inches and the shipping cubage, weight, and tonnage for the van body only.

(2) The van body identification plate (B), located on the lower right rear of the van body, gives the manufacturer's name, type, date, and serial number.

(3) The heater identification plate (C), located on the front of the heater, provides starting, operating, and stopping instructions. It also specifies the manufacturer, model, serial number, volts, cycles, amperes, and the rating in BTU.

(4) The erdlator agitator gear assemblies identification plate (D), located on the gear assembly housing, specifies the manufacturer, model number, service factor, ratio, input rpm, output rpm, horsepower, torque, and serial number.

(5) The filter pump assembly identification plate (E), located on the pump housing specifies the manufacturer, type, serial number, gpm (gallons-per-minute), hd-ft (head-foot), and rpm.

(6) The slurry feeder assembly identification plate (F), located on the front of the slurry feeder assembly specifies the manufacturer, component name, model number, serial number, part number, and capacity measured in gph.

(7) The filter pump motor assembly identification plate (G), located on top of the motor stator cover, specifies the manufacturer, phase, amperes, type, frame, horsepower, cycles, revolutions per minute, duty, temperature rise, ambient temperature, class, and motor model.

(8) The erdlator agitator motor assembly identification plate (H), located on the motor stator, specifies the manufacturer, horsepower, revolutions per minute, phase, volts, amperes, cycles, temperature rise, frame, service factor, model number, serial number, and code.

(9) The slurry feeder motor assembly identification plate (I), located on the motor stator, specifies the manufacturer, horsepower, revolutions per minute, volts, amperes, cycles, temperature rise, frame, service factor, model number, serial number, and code.

(10) The air release valve identification plate (J), located on the front of the valve housing, specifies the manufacturer, component name, model and part number.

(11) The chemical solution feeder assembly identification plate (K), located on the rear of the solution feeder housing, specifies the manufacturer, component name, part number, model number, serial number, volt, cycles, phase, amperes, type oil, and capacity.

(12) The diatomite filter assembly identification plate (L), located on the front of the filter, specifies the manufacturer, component name, model number, serial number, and part number.

(13) The erdlator tank assembly identification plate (M), located on the erdlator tank, specifies the manufacturer, component name, model number, serial number, part number and capacity.

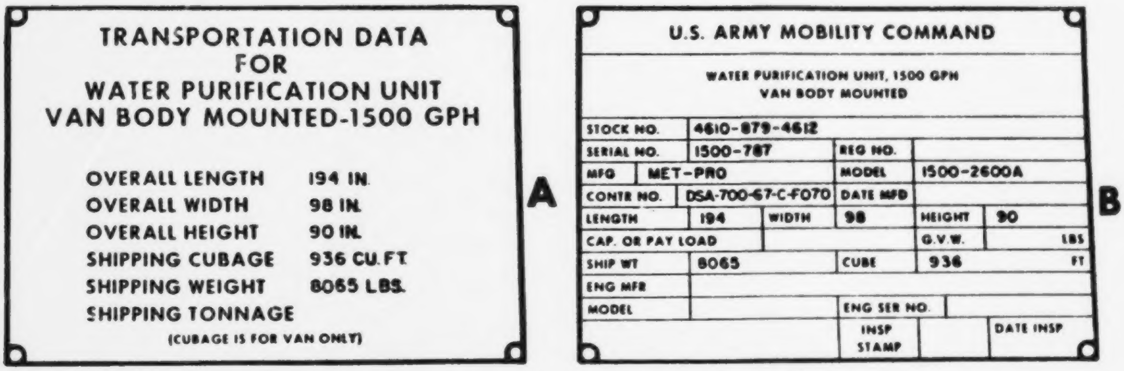
(14) The slurry feeder gear assembly identification plate (N), located on the gear assembly housing, specifies the manufacturer, model number, service factor, ratio, input rpm, output rpm, horsepower, torque, and serial number.

b. Tabulated Data.

(1) General. The maintenance data are tabulated in the following subparagraphs. Refer to the applicable technical manuals for the truck chassis tabulated data and the cargo trailer tabulated data. Tabulated data for the 10 kw (kilowatt), alternating current, 110 volt, 1- and 3-phase, 60 Hz generator set and distribution pumps will be found in the applicable technical manuals contained with the equipment. A wiring diagram of the water purification unit van body is shown in FO-1 (located in back of manual), and a wiring diagram of the control cabinet is shown in FO-2 (located in back of manual).

(2) Water purification unit.

Manufacturer	Met-Pro Water Treatment Corp. Environmental Tectonics Corp.
Model	1500-2600A
Type	Van-type body
Capacity	1,500 gph



TRANSPORTATION DATA
FOR
WATER PURIFICATION UNIT
VAN BODY MOUNTED-1500 GPH

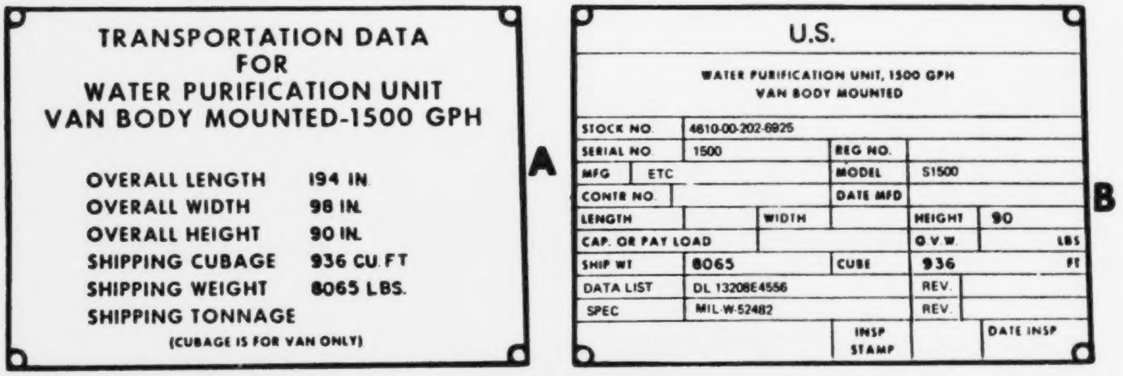
OVERALL LENGTH 194 IN.
OVERALL WIDTH 98 IN.
OVERALL HEIGHT 90 IN.
SHIPPING CUBAGE 936 CU. FT
SHIPPING WEIGHT 8065 LBS.
SHIPPING TONNAGE
(CUBAGE IS FOR VAN ONLY)

U.S. ARMY MOBILITY COMMAND

WATER PURIFICATION UNIT, 1500 GPH
VAN BODY MOUNTED

STOCK NO. 4610-879-4612
SERIAL NO. 1500-787 REG NO.
MFG MET-PRO MODEL 1500-2600A
CONTR NO. DSA-700-67-C-F070 DATE MFD
LENGTH 194 WIDTH 98 HEIGHT 90
CAP. OR PAY LOAD G.V.W. LBS
SHIP WT 8065 CUBE 936 FT
ENG MFR
MODEL ENG SER NO.
INSP STAMP DATE INSP

MET-PRO WATER TREATMENT CORPORATION



TRANSPORTATION DATA
FOR
WATER PURIFICATION UNIT
VAN BODY MOUNTED-1500 GPH

OVERALL LENGTH 194 IN.
OVERALL WIDTH 98 IN.
OVERALL HEIGHT 90 IN.
SHIPPING CUBAGE 936 CU. FT
SHIPPING WEIGHT 8065 LBS.
SHIPPING TONNAGE
(CUBAGE IS FOR VAN ONLY)

U.S.

WATER PURIFICATION UNIT, 1500 GPH
VAN BODY MOUNTED

STOCK NO. 4610-00-202-6925
SERIAL NO. 1500 REG NO.
MFG ETC MODEL S1500
CONTR NO. DATE MFD
LENGTH WIDTH HEIGHT 90
CAP. OR PAY LOAD G.V.W. LBS
SHIP WT 8065 CUBE 936 FT
DATA LIST DL 13208E4556 REV.
SPEC MIL-W-52482 REV.
INSP STAMP DATE INSP

ENVIRONMENTAL TECTONICS CORPORATION

TS 4610-221-34/1-6 ①

Figure 1-6. Identification Plates (Sheet 1 of 3)

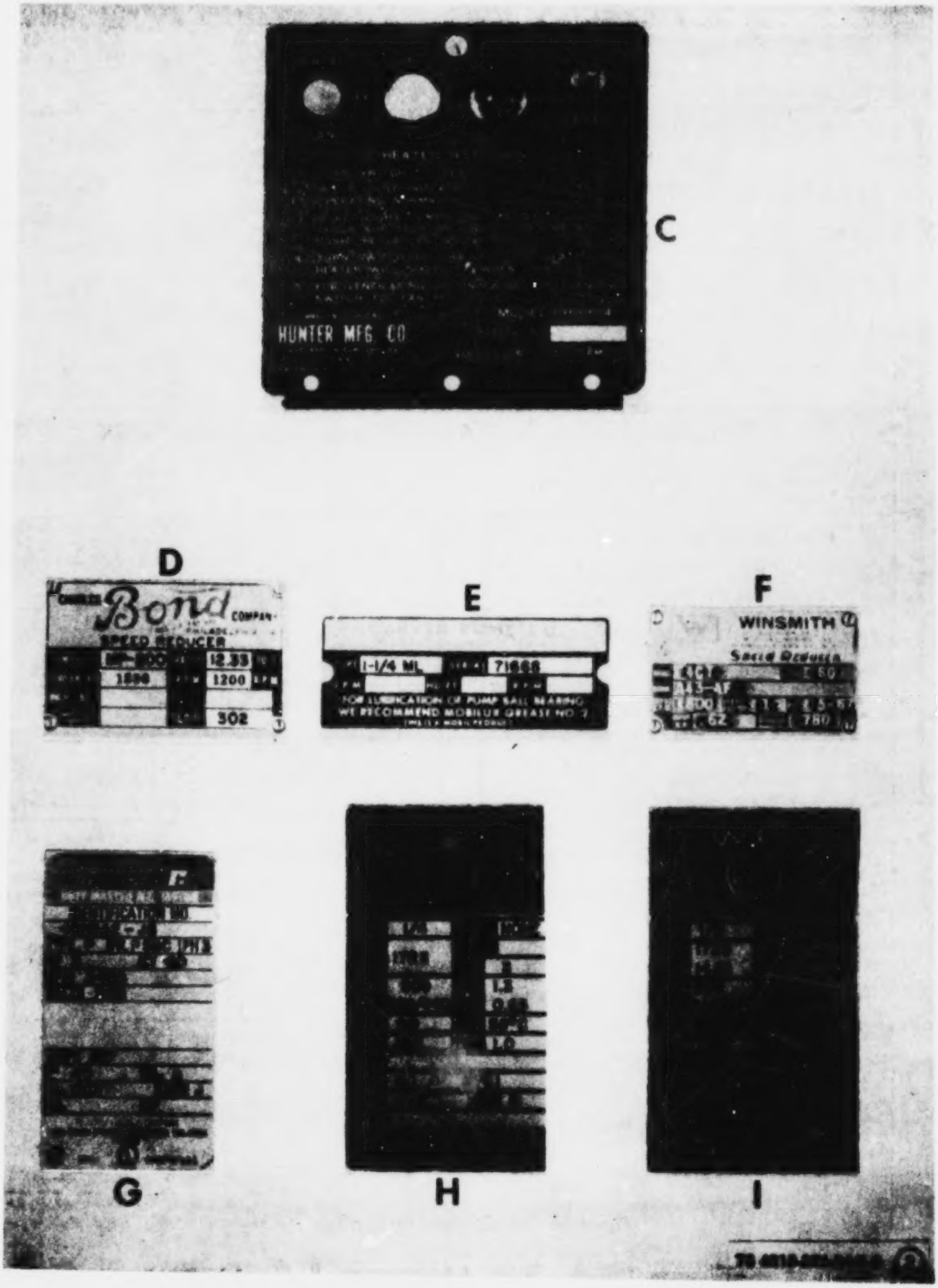

C
HUNTER MFG. CO
D
Bond
COMPANY
SPEED REDUCER
12.33
1800
1200
302
E
1-1/4 ML
71668
FOR LUBRICATION OF PUMP BALL BEARING
WE RECOMMEND MOBILUX GREASE NO. 2
F
WINSMITH
Speed Reducer
A43-AF
780
G
H
I

Figure 1-6. Identification Plates (Sheet 2 of 3)

J

MET-PRO WATER TREATMENT CORP.
LANSDALE, PA.
AIR RELEASE VALVE
MODEL 2003 SERIAL NO.

L

MET-PRO WATER TREATMENT CORP.
LANSDALE, PA.
DIATOMITE FILTER
MODEL 2002-2 SERIAL NO.

K

CHEMICAL FEEDER

SER NO.	6620
MFR NO.	13214E6620
MFR NAME	MET-PRO
VOLTS	115
CYCLES	60
AMPS	0.5
FSN	

U.S.

M

MET-PRO WATER TREATMENT CORP.
LANSDALE, PA.
ERDLATOR
MODEL 2005-2 SERIAL NO.

N

MET-PRO WATER TREATMENT CORP.
LANSDALE, PA.
SLURRY FEEDER
MODEL-2001-2

MET-PRO WATER TREATMENT CORPORATION

J

ENVIRONMENTAL TECTONICS CORP.
SOUTHAMPTON, PENNA.
AIR RELEASE VALVE
MODEL 7458 SERIAL NO. 1500-

L

ENVIRONMENTAL TECTONICS CORP.
SOUTHAMPTON, PENNA.
DIATOMITE FILTER
MODEL 7432 SERIAL NO. 1500-

K

CHEMICAL FEEDER

SER NO.	TT-27093
MFR NO.	UXA-16192
MFR NAME	W & T INC.
VOLTS	115
CYCLES	60
AMPS	0.53
FSN	4610-901-1351

U.S.

M

ENVIRONMENTAL TECTONICS CORP.
SOUTHAMPTON, PENNA.
ERDLATOR
MODEL 7351 SERIAL NO. 1500-

N

ENVIRONMENTAL TECTONICS CORP.
SOUTHAMPTON, PENNA.
SLURRY FEEDER
MODEL 450 SERIAL NO. 1500-

ENVIRONMENTAL TECTONICS CORPORATION

TS -4610-221-34/1-6 ③

Figure 1-6. Identification Plates (Sheet 3 of 3)

(3) Erdlator tank assembly.

Manufacturer .	Met-Pro Water Treatment Corp. Environmental Tectonics Corp.
Part number ..	13206E7358
Capacity	1,500 gph

(4) Diatomite filter assembly.

Manufacturer .	Met-Pro Water Treatment Corp. Environmental Tectonics Corp.
Part number ..	13206E7432
Type	Diatomaceous earth

(5) Slurry feeder assembly.

Manufacturer .	Met-Pro Water Treatment Corp. Environmental Tectonics Corp.
Part number ..	MPD9576-19-A
Capacity	14 gallons (53 liters) per compartment

(6) Erdlator agitator gear assembly.

Manufacturer .	Charles Bond Co.
Model	MP200
Service factor .	2.0
Ratio	12.33:1
Input speed ...	1,800 rpm
Output speed ..	146 rpm
Horsepower ...	1.25
Torque	400 ft-lb

(7) Slurry feeder gear assembly.

Manufacturer .	Winsmith
Model	1-L-4CT
Service factor .	2.0
Ratio	60:1
Input speed ...	1,800 rpm
Output speed ..	29 rpm
Horsepower ...	3/4
Torque	780 ft-lb

(8) Chemical solution feeder assembly.

Manufacturer .	Met-Pro Water Treatment Corp. Environmental Tectonics Corp.
Part number ..	13214E6620
Volts	115
Hertz	60
Phase	1
Pump	2 diaphragm
Maximum lift .	6 ft (1.8 meters)
Vacuum	30 in.-lb
Strokes per minute	12
Range of pumping head	12 to 60 gal. per day
Feed rate	1/2 to 2 1/2 gph
Motor	Immersed in oil
Feeder oil capacity	1 1/4 quart

(9) Rate of flow indicator.

Manufacturer .	Brooks Instrument Co.
Service working pressure ..	500 psi (pounds per square inch)
Part number ..	L-3609-007
Flow range ...	0-50 gpm

(10) Flow control valve.

Manufacturer .	Met-Pro Water Treatment Corp. Environmental Tectonics Corp.
Flow range ...	0-30 gpm
Part number ..	13206E7481

(11) Water level alarm float valve.

Manufacturer .	Hoffman Corp.
Part number ..	850
Type	87 Float
Working pressure	100 lb

(12) Three-way plug valve (coagulated water).

Manufacturer .	Met-Pro Water Treatment Corp. Environmental Tectonics Corp.
Part number ..	13212E6903-1
Type	3-way, 2-port, lubricated
Working pressure	200 lb

(13) Three-way plug valve (filtered water).

Manufacturer .	Met-Pro Water Treatment Corp. Environmental Tectonics Corp.
Part number ..	13212E6899
Type	3-way, 3-port, lubricated
Working pressure	200 lb

(14) Air release valve.

Manufacturer .	Met-Pro Water Treatment Corp. Environmental Tectonics Corp.
Part number ..	13206E7458

Model	5 sq. in. (square inches)

(15) Slurry feeder motor assembly.

Manufacturer	Howell Electric Motor Company, Division of Kingston Conley
Horsepower	1/4
Speed	1,725 rpm
Volts	208-220
Amperes	0.65
Hertz	60
Rise	55 degrees C (99 degrees F)
Frame	J-56
Part number	40-A2-2702
Design	B
Service factor	1.0

(16) Erdlator agitator motor assembly.

Manufacturer	Howell Electric Motor Company, Division of Kingston Conley
Horsepower	1/2
Speed	1,725 rpm
Phase	3
Volts	208
Amperes	1.9
Hertz	60
Rise	55 degrees C (99 degrees F)
Frame	N56
Service factor	1.0
Serial number	UD/4643
Code	M
Part number	40-A1-4522

(17) Filter pump motor assembly.

Manufacturer	Reliance Motor Co.
Phase	3
Volts	208
Amperes	6.0
Type	P
Horsepower	2
Hertz	60
Frame	P56C
Speed	3,450 rpm
Duty	Continuous
Rise	55 degrees C (99 degrees F)
Ambient temperature	40 degrees C (104 degrees F)
Class	Insulation A
Part number	406842AU

(18) Filter pump motor rebuild data.

Number of poles	2
Number of slots	24
Number of coils	24
Coil span	1-8
Turns per coil (1-21 & 1-22 in parallel)	31
Wire sizes	No. 21 & 11 AWG
Type of Wire	Type T, heavy synthetic resin coated round, copper, magnet wire per Military Specification MIL-W-583A
Type of winding	2 circuit wye
Insulation materials:	
Slot cell - laminated from 0.005 in. rag paper, 0.002 in. mylar, and 0.005 rag paper	24
Slot separator - 0.007 in. varnished Cambric	24
Phase separator - 0.007 in. varnished Cambric	12
Slot wedge - hard fiber	24
Dipping compounds:	
Type AN, grade CB, clear baking varnish per Military Specification MIL-V-1137A	
Type AN, grade CA, clear air-drying varnish per Military Specifiction MIL-V-1137A	
Dipping and baking procedures:	
Preheat at 250 degrees F (121 degrees C) for 1 hour	
Dip in baking varnish until bubbling stops	
Drain until dripping stops	
Bake at 275 degrees F (135 degrees C) for 6 hours	
Dip in air-dry varnish until bubbling stops	
Air-dry until not sticky	
Fungus treatment:	
Apply 1 coat of varnish per MIL-V-178 and air at room temperature until not sticky.	

(19) Filter pump assembly.

Manufacturer	Carver Pump Co.
Serial number	P101-4254
Type	1 1/4 ML
Head foot	115
Gallons-per-minute	25

(20) Slurry feeder slip clutch assembly.

Manufacturer	The Hilliard Corp.
Part number	L-4-1-312K
Torque	25 ft-lb output

(21) Cabinet assembly electrical equipment.

Manufacturer	Met-Pro Water Treatment Corp. Environmental Tectonics Corp.
Part number	D31206E7421

(22) Stepdown transformer.

Manufacturer	Jefferson Electric Co.
Type	115
Primary volts	115 ac (alternating current)
Secondard volts	6 ac
Hertz	60
Part number	230-221

(23) Motor starter.

Manufacturer	General Electric Co.
Type	CR 106 BOO2BCA
Class	2
Horsepower	2
Volts	208
Phase	3
Hertz	60

(24) Start and stop push switch.

Manufacturer	General Electric Co.
Part number	CR 294OUM200A/294
Contact rating	600 volts

(25) Start push switch.

Manufacturer	General Electric Co.
Part number	CR294OUA202B
Contact rating	600 volts

(26) Stop push switch.

Manufacturer	General Electric Co.
Part number	CR294OUA202C
Contact rating	600 volts

(27) Circuit breaker.

Manufacturer	Heineman Electric Co.
Amperes	30
Volts	120/240
Part number	2263-C curve 1-S

(28) Influent and effluent pressure gage.

Manufacturer	United States Gage Co., Ametek
Type	P644U
Range	0-100 psi

(29) Raw water pressure gage.

Manufacturer	United States Gage Co., Ametek
Part number	P500 3 1/2 dial
Range	0-30 psi

(30) Low water level sensitive switch.

Manufacturer	Micro Switch Corp., Division of Minneapolis-Honeywell Regulator Co.
Catalog number	BZV-2RN
Volts	125
Amperes	15
Actuated plunger pressure	9-24 oz

(31) Personnel heater.

Manufacturer	Hunter Manufacturing Co.
Model	UH-68-4 unit serial numbers 784-994
Model	UH-68-D unit serial numbers 995-1083
Serial number range	4367-4586, 4770-5962
Volts	115 ac
Amperes	8.0
Fuel	Multi-fuel
Fuel consumption	3/4 gph
Rated heat	60,000 BTU
Power consumption (starting)	400 watt
Power consumption (running)	800 watt
Air output	500 cfm (cubic ft per minute)
Weight	120 lb. (54.4 kg)

Width	21 3/16 in. (0.54 m)
Height	11 1/16 in. (0.28 m)
Length	28 3/8 in. (0.72 m)
Ventilating motor:	
Volts	115
Phase	1
Hertz	60
Horsepower	1/6
Speed	1,725 rpm
Combustion blower motor:	
Volts	115
Phase	1
Hertz	60
Horsepower	3/8
Speed	10,000 rpm

(32) Dimensions and weight.

(a) Water purification unit mounted on truck chassis (fig. 1-9).

Length	280 in. (7.1 m)
Width	98 in. (2.5 m)
Height	131 in. (3.3 m)
Cubage	2,144 cu. ft (60.72 cu. m)
Weight	19,000 lb (8618 kg)

(b) Water purification unit.

Length	194 in. (4.9 m)
Width	98 in. (2.5 m)
Width (with left side door open)	135 in. (3.4 m)
Height	90 in. (2.3 m)
Cubage	936 cu. ft (26.51 cu. m)
Weight	8,065 lb (3658 kg)

(33) Capacities.

Erdlator tank	530 gal. (2006 liters)
Wet well tank	150 gal. (568 liters)
Sludge concentrator tank	180 gal. (681 liters)
Chemical solution tank	5 gal. (each) (19 liters)
Slurry feeder assembly	14 gal. (53 liters) (each compartment)
Water rise at 1,500 gph	1.1 gpm per sq. ft
Chemical solution feeder assembly gearcase	1 1/4 qts (quarts)
Erdlator agitator gear assembly gearcase	18 ounces
Slurry feeder gear assembly gearcase	24 ounces

1-7. Repair and Replacement Standards. Table 1-1 lists the component repair and replacement standards for the slurry feeder assembly, chemical solution feeder assembly and the erdlator agitator.

1-8. Differences in Models. This manual covers only the van-type body mounted water purification units, Met-Pro Model 1500-2600A, and ETC Model S1500. Units bearing serial numbers 816 to 1083 have different right side and rear door hardware and raw water flowmeter than units bearing serial numbers 787-815. Serial numbers 995-1083 have a later model personnel heater than units bearing serial numbers 787-994. Where applicable, differences between units carrying specific serial numbers are noted at each paragraph.

Table 1-1. Component Repair and Replacement Standards

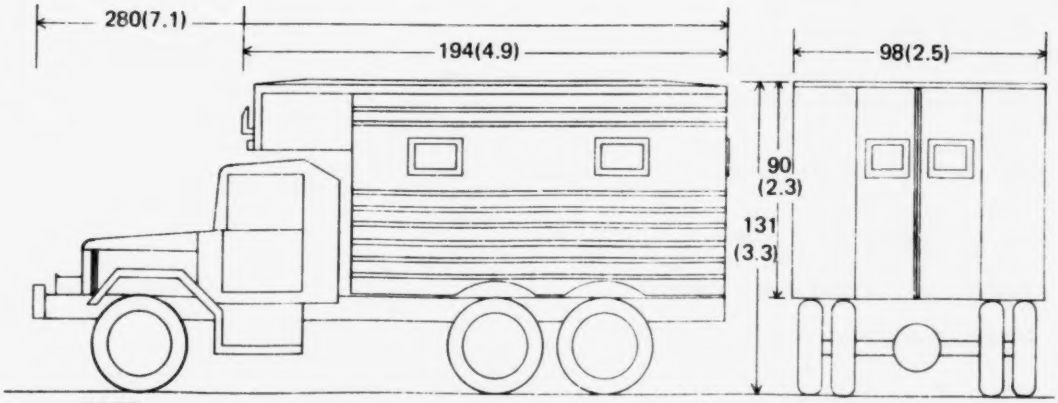
NOTE

The manufacturer's dimensions and tolerances are given in U.S. inches and Metric measurements. All Metric units are enclosed in brackets.

Component	Manufacturer's dimensions and tolerances in inches (mm)		Desired clearance		Maximum allowable wear and clearance
	Minimum	Maximum	Minimum	Maximum	
Chemical Solution Feeder Assembly:					
Main gear shaft & L. H. main bearing			0.0003 (0.008)	0.0006 (0.015)	
Main gear shaft & R. H. main bearing			0.0001 (0.0025)	0.0002 (0.005)	
Shaft bearing surface diameter (L. H.)	0.6687 (16.985)	0.6690 (16.993)			0.0000
Bearing, inside diameter (L. H.)	0.6693 (17.000)	0.6693 (17.000)			0.0000
Shaft bearing surface diameter (R. H.)	0.6298 (15.997)	0.6301 (16.005)			0.0000
Bearing, inside diameter (R. H.)	0.6299 (15.999)	0.6299 (15.999)			0.0000
Main gear shaft & driving arm bearings			0.0005 (0.0127)	0.0010 (0.0254)	
Shaft bearing surface diameter	0.3140 (7.9756)	0.3145 (7.988)			0.0000
Driving arm bearing, inside diameter	0.3150 (8.001)	0.3150 (8.001)			0.0000
Lever arm bearings and shaft			0.0000	0.0014 (0.0356)	
Shaft bearing surface diameter	0.7506 (19.065)	0.7510 (19.075)			0.0010 (0.0254)
Bearing, inside diameter	0.7510 (19.075)	0.7520 (19.101)			0.0050 (0.127)
Hinge block and pin			0.0015 (0.038)	0.0040 (0.1016)	
Pin diameter	0.3100 (7.874)	0.3115 (7.912)			0.0010 (0.0254)
Hinge block bearing, inside diameter	0.3130 (7.950)	0.3140 (7.9756)			0.0050 (0.127)

Table 1-1. Component Repair and Replacement Standards (Cont)

Component	Manufacturer's dimensions and tolerances in inches (mm)		Desired clearance		Maximum allowable wear and clearance
	Minimum	Maximum	Minimum	Maximum	
Driving arm bearing and scale pointer			0.0030 (0.076)	0.0090 (0.229)	
Scale pointer diameter	0.3700 (9.398)	0.3750 (9.525)			0.0010 (0.0254)
Driving arm bearing	0.3780 (9.601)	0.3790 (9.6266)			0.0050 (0.127)
Slurry Feeder Assembly:					
Shaft and main bearing			0.0027 (0.0686)	0.0097 (0.246)	
Shaft bearing surface diameter	1.2140 (30.8356)	1.2160 (30.886)			0.0050 (0.127)
Main bearings, inside diameter	1.2187 (30.955)	1.2237 (31.082)			0.0050 (0.127)
Erdlator Agitator					
Agitator bottom stub shaft and bearing			0.0020 (0.051)	0.0000	
Stub shaft diameter	1.1230 (28.524)	1.1250 (28.575)			0.0050 (0.127)
Bearing inside diameter	1.1250 (28.575)				0.0100 (0.254)


280(7.1)
194(4.9)
98(2.5)
90
(2.3)
131
(3.3)

NOTE
DIMENSIONS ARE IN INCHES (METERS).

TS 4610-221-34/1-7

Figure 1-7. Shipping Dimensions

CHAPTER 2

MAINTENANCE INSTRUCTIONS

Section I. REPAIR PARTS, SPECIAL TOOLS, AND EQUIPMENT

2-1. Special Tools and Equipment. No special tools or equipment are required to perform direct and general support maintenance on the water purification unit or the van body.

2-2. Repair Parts. Repair parts for direct and general support maintenance are listed and illustrated in the repair parts and special tools lists, TM 5-4610-221-34P. Repair parts for the heater are listed in TM 5-4520-227-14.

2-3. Fabricated Tools and Equipment. No fabricated tools or equipment are required to perform direct and general support maintenance on the water purification unit or the van body.

Section II. TROUBLESHOOTING

2-4. General.

a. This section contains troubleshooting information for locating and correcting most of the operating troubles which may develop in the water purification unit. Each malfunction for an individual component, unit, or system is followed by a list of tests or inspections which will help you to determine corrective actions to take. You should perform the tests/inspections and corrective actions in the order listed.

b. This manual cannot list all malfunctions that may occur, nor all tests or inspections and corrective actions. If a malfunction is not listed or is not corrected by listed corrective actions, notify your supervisor.

2-5. Troubleshooting. Table 2-1 lists the malfunctions and corrective actions authorized to direct and general support maintenance by the MAC.

NOTE

Before you use this table, be sure you have performed all applicable operating checks. If you have a malfunction which is not listed in this table, notify the next higher level of maintenance.

Section III. GENERAL MAINTENANCE

2-6. General. The instructions contained herein are for the use of direct and general support personnel responsible for maintenance of the water purification unit.

2-7. Maintenance Procedures. General procedures for repair and replacement of the components of the water purification unit are outlined below. Refer to Chapter 3 for specific repair procedures.

a. Unless otherwise specified, solvent conforming to Specification P-D-680 or equivalent, shall be applied by spray, brush, cloth or dip methods when solvent cleaning requirement is indicated.

b. Unless otherwise specified, compressed air pressure no higher than 50 psi to 60 psi may be used when drying requirement is indicated.

c. Common hardware, lockwashers, cotter pins, flat washers, and pins damaged during removal or disassembly shall be replaced.

d. Threaded fasteners with crossed, stripped threads and broken, twisted, distorted wrench and/or slotted heads shall be replaced.

e. All gaskets and seals removed during removal and/or disassembly of items or components shall be replaced.

f. Broken, missing, deteriorated wire protection grommets in metal shall be replaced.

Table 2-1. Troubleshooting

MALFUNCTION
    TEST OR INSPECTION
        CORRECTIVE ACTION

---

1. WATER PURIFICATION UNIT RECEIVES INSUFFICIENT OR NO RAW WATER.

    Check for defective raw water pump motor starter.

        Replace motor starter (para 3-3).

2. CHEMICAL SOLUTION FEEDER ASSEMBLY DELIVERS LITTLE OR NO SOLUTION.

    Step 1. Check for defective filter pump body, plunger, or diaphragm.

        Replace pump plunger, diaphragm or body (para 3-19).

    Step 2. Check for defective motor starter.

        Replace motor starter (para 3-3).

    Step 3. Check for defective chemical solution feeder assembly.

        Repair or replace feeder assembly (para 3-9).

3. SLURRY FEEDER ASSEMBLY DELIVERS LITTLE OR NO SLURRY.

    Step 1. Check for defective slurry feeder assembly.

        Repair or replace slurry feeder assembly (para 3-9).

    Step 2. Check for defective motor starter or armature relay.

        Repair or replace motor starter or armature relay (para 3-3).

4. LOW WATER INDICATOR LIGHT OR WARNING BUZZER INOPERATIVE.

    Check for defective transformer.

        Replace transformer (para 3-4).

Table 2-1. Troubleshooting - Continued

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

---

5. ERDLATOR TANK FAILS TO KEEP SLURRY BLANKET ROTATING.

Step 1. Check for defective erdlator agitator gear assembly.

Repair or replace agitator gear assembly (para 3-17).

Step 2. Check for defective agitator or bearing.

Repair or replace agitator or bearing (para 3-16).

Step 3. Check for defective motor starter or armature relay.

Repair or replace starter or relay (para 3-3).

Step 4. Check for defective downcomer tube.

Repair or replace downcomer tube (para 3-18).

6. FILTER PUMP MOTOR ASSEMBLY FAILS TO RUN.

Step 1. Check for defective filter pump motor assembly.

Repair or replace filter pump motor assembly (para 3-2).

Step 2. Check for defective motor starter or armature relays.

Repair or replace starter or relay (para 3-3).

Step 3. Check for defective filter pump cable and box.

Repair or replace cable or junction box (para 3-19).

7. DIATOMITE FILTER HAS LOW OR NO PRESSURE.

Step 1. Check if filter pump is running.

Refer to MALFUNCTION 6.

Table 2-1. Troubleshooting - Continued

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

Step 2. Check for defective plug valves.

Repair plug valves (para 3-12 and 3-14).

Step 3. Check for defective air release valve.

Repair air release valve (para 3-15).

8. FILTER PUMP ASSEMBLY FAILS TO PUMP WATER.

Step 1. Check for defective motor starter.

Replace the motor starter (para 3-3).

Step 2. Check for defective erdlator agitator gear assembly.

Replace erdlator agitator gear assembly (para 3-17).

Step 3. Check for defective filter pump assembly.

Repair or replace filter pump assembly (para 3-19).

Step 4. Check for defective filter pump motor assembly.

Replace filter pump motor assembly (para 3-2).

CHAPTER 3

REPAIR INSTRUCTIONS

Section I. FRAME

3-1. Leveling Jacks.

a. General. Four screw type leveling jacks are supplied with the van. The jacks are stored in the jack stowage box under the van body. The leveling jack assemblies provide a means of leveling the water purification unit.

b. Removal. Remove the leveling jacks from the stowage box.

c. Disassembly.

(1) Turn the bases (1, fig. 3-1) so two of the prongs are even with the two notches on the balls. Pry the prongs up enough to remove the bases from the screw (2) and the extension (7).

(2) Turn the lever (3) clockwise until the screw (2) is removed from the housing (4) and lever (3).

(3) Grind the nubs on housing (4) off enough to remove the lever (3) from the housing.

(4) Remove the chain (5) by cutting the weld from the extension (7).

(5) Separate the chain (5) from the pin (8) by prying the loop portion of the pin open enough to allow the ring of the chain to drop away from the pin.

(6) Cut the ball (6) from the extension (7) if it requires replacing.

d. Cleaning, Inspection, and Repair.

WARNING

Drycleaning solvent, P-D-680, used to clean parts is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Do not use near open flame or excessive heat. Flash point of solvent is 100 degrees F - 138 degrees F (38 degrees C - 59 degrees C).

(1) Clean all parts in cleaning solvent (item 1, App. C).

(2) Inspect all parts for cracks, breaks, damaged screw threads, and a missing pin.

(3) Replace all unserviceable parts. A pin or attaching chain may be fabricated from bulk material.

e. Reassembly.

(1) Install the bases (1, fig. 3-1) on the balls of the extension (7) and the screw (2) and drive the prongs back in line.

(2) Weld the chain (5) to the extension (7) and place the chain ring in the loop of the pin (8) and close up the loop if these parts were removed.

(3) Install the lever (3) on the housing (4) and build up the nubs on the housing by welding.

(4) Install the extension (7) over the housing (4) and secure it to the housing with the pin (8).

(5) Position the screw (2) in the lever (3) and turn the lever until the screw (2) is in the housing (4) as far as it will go.

(6) Weld a new ball (6) on extension (7) if the old ball was removed.

f. Installation. Position the jacks in the jack stowage box under the van body.

Section II. ELECTRIC MOTORS (OTHER THAN ENGINE ACCESSORIES)

3-2. Filter Pump Motor.

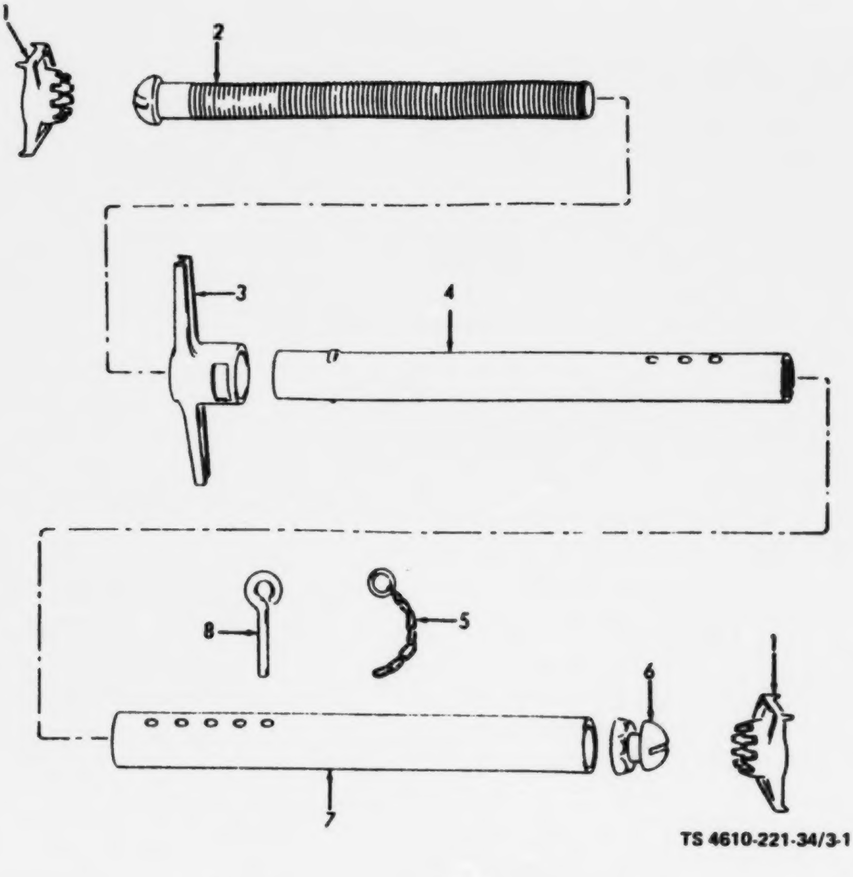
a. Removal and Disassembly.

(1) Remove the filter pump motor assembly (para 3-16) and disassemble the electric cable. Remove the four screws (18, fig. 3-2) and cover (17) from the junction box (14).

(2) Remove the two screws (16) and lockwashers (15) and remove the junction box (14) and bushing (13) from the stator (7).

(3) Remove the three screws (22) and remove the fan cover (1) from the front endbell (3).

(4) Remove the two setscrews (21) and pull the fan (2) off the shaft of the rotor assembly (6).



TS 4610-221-34/3-1

1. Base (2)	5. Chain (2 ft)
2. Screw	6. Ball (2)
3. Lever	7. Extension
4. Housing	8. Pin

Figure 3-1. Leveling Jack, Exploded View

(5) Remove the four through bolts (19) and lockwashers (20) and remove the front endbell (3) from the stator (7). Remove the thrust washer (4) from the bearing recess in the front endbell.

(6) Remove the rear endbell (11) with attached rotor assembly (6) from the stator (7).

(7) Remove the three screws (12) that secure the rear endbell to the retaining washer (8) and remove the rear endbell.

(8) Remove the felt washer (10) from the bearing recess in the rear endbell.

(9) Pull the bearing (9) off the shaft of the rotor assembly and remove the retaining washer (8).

(10) Pull the bearing (5) off the other end of the rotor assembly.

b. Cleaning, Inspection, Testing, and Repair.

WARNING

Drycleaning solvent, P-D-680, used to clean parts is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Do not use near open flame or excessive heat. Flash point of solvent is 100 degrees F - 138 degrees F (38 degrees C - 59 degrees C).

(1) Clean all metal parts with cleaning solvent (item 1, App. C). Do not clean the bearings with cleaning solvent.

(2) Inspect the shaft and fan of the rotor assembly for nicks, burrs, damaged screw threads and keyways, and distortion. Replace a damaged rotor assembly.

(3) Inspect the bearings for restrictions and evidence of being burned out. Replace a damaged or defective bearing.

(4) Inspect the endbells for cracks, breaks, and damaged screw threads. Replace a damaged endbell.

(5) Inspect the outlet screen for tears and enlarged holes. Replace the outlet screen if damaged.

(6) Inspect the spring washers for cracks, breaks, and fatiqued spring tension. Replace a defective spring washer

(7) Test the field coil assembly for continuity, short circuits, and insulation resistance as instructed in TM 5-764. The insulation resistance should be not less than 0.25 megohm.

c. Reassembly and Installation.

(1) Press the bearing (5, fig. 3-2) on the shaft of the rotor assembly (6).

(2) Install the retaining washer (8) on the other end of the rotor assembly (6) and press the bearing (9) on the shaft of the rotor assembly.

(3) Install the felt washer (10) in the bearing recess of the rear endbell (11).

(4) Install the rear endbell on the rotor assembly (6), seating the bearing (9) in the recess. Secure the rear endbell to the retaining washer (8) with the three screws (12).

(5) Install the rotor assembly (6) in the stator (7) and seat the rear endbell (11).

(6) Install the thrust washer (4) in the bearing recess of the front endbell (3) and install the front endbell on the stator. Secure the endbells and stator together with the four lockwashers (20) and through-bolts (19).

(7) Install the fan (2) on the end of the rotor assembly shaft that protrudes through the endbell and secure with the two setscrews (21).

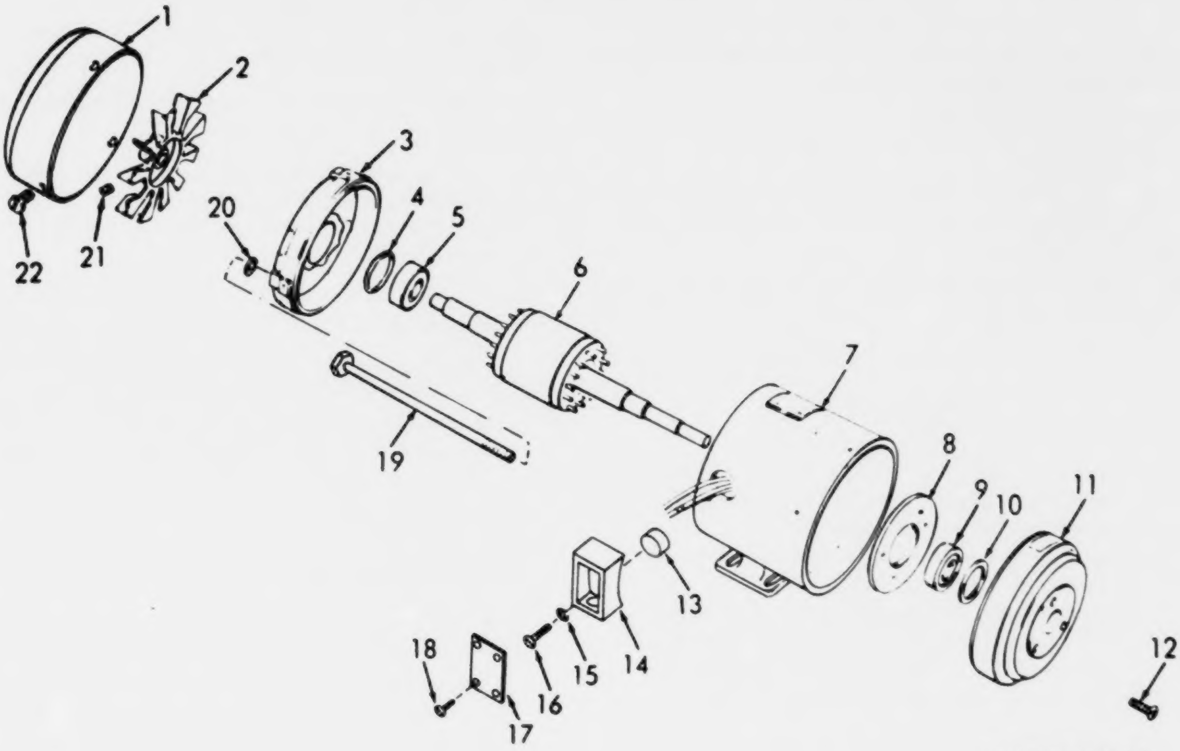
(8) Install the fan cover (1) on the front endbell (3) and secure with the three screws (22).

(9) Position the bushing (13) and the junction box (14) to the side of the stator (7) and secure with the two lockwashers (15) and screws (16). Secure the cover (17) to the junction box with four screws (18).

(10) Reassemble the electric cable and install the filter pump motor assembly.

3-3. Magnetic Motor Starters.

a. General. The five-line voltage type motor starters connect the windings of the various electrical motors to the source of power at full voltage. Each motor starter consists of a magnetically actuated contactor to provide motor overload protection. The motor overload protection is furnished by two armature relays connected in series with the motor windings. The electrical components within the sheet-metal control cabinet are connected by a wiring harness and the components outside the control cabinet are connected through a cable. Replace at direct support level.



TS 4610-221-34/3-2

1. Fan cover
2. Fan
3. Front endbell
4. Thrust washer
5. Bearing
6. Rotor assembly
7. Stator
8. Retaining washer
9. Bearing
10. Felt washer
11. Rear endbell
12. Screw, machine, No. 10-32 x 1 in. (3)
13. Bushing
14. Junction box
15. Washer, lock (2)
16. Screw, machine (2)
17. Cover
18. Screw (4)
19. Through-bolt, No. 10-32 x 8 5/8 in. (4)
20. Lockwasher No. 10 (4)
21. Setscrew, 1/4-20 x 3/8 in. (2)
22. Screw, machine, No. 10-32 x 3/8 in. (3)

Figure 3-2. Filter Pump Motor Assembly, Exploded View

b. Removal and Disassembly.

WARNING

Be certain that the electrical supply lines are disconnected before performing any maintenance on the electrical system.

(1) Open the control cabinet door.

(2) Remove the four terminal screws (6, fig. 3-3) and tag and disconnect the electrical leads from the overload relay (5).

(3) Loosen the eight terminal screws (4) and tag and disconnect the electrical leads from the motor starter.

(4) Remove the three screws (1) and lockwashers (2) and remove the motor starter (3) from the control cabinet (7).

(5) Remove the four remaining motor starters in a similar manner.

(6) Pull the armature spring clip (11, fig. 3-4) forward and slide it out of the slot and remove the front portion of the armature and frame (12).

(7) Press the coil (10) and pull slightly on the coil retainers (21), moving the coil retainers away from the coil to free the operating arm (8).

(8) Remove the coil (10) and the back portion of the armature and frame (12).

(9) Remove the contact cover (9) from the operating arm (8).

(10) Remove the contact arm spring (7) from the operating arm (8).

(11) Remove the movable contact and spring portion of the contact set (13) from the operating arm.

(12) Remove the terminal screw (14) that secures the stationary contact portion of the contact set (13) to the support (3).

NOTE

Do not replace a single contact set without replacing the entire set of four.

(13) Remove the two screws (19) that secure the two armature relays (17) to the mounting brackets (4 and 18).

(14) Lift the armature relays from the mounting brackets and remove the four screws (15) that secure the overload heaters (16) in the armature relays.

(15) Lift the mounting brackets (4 and 18) and the two insulations (20) from the slot of the support (3).

(16) Lift the two coil retainers (21) from the slot of the support (3) and remove the two terminal screws (23) and the two coil retainer nuts (22) from the coil retainers.

(17) Remove the two spring guides (1) and the two coil retainer springs (2) from the support (3).

(18) Disassemble the other four motor starters and armature relays in a similar manner.

c. Cleaning, Inspection, and Repair.

WARNING

Drycleaning solvent, P-D-680, used to clean parts is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Do not use near open flame or excessive heat. Flash point of solvent is 100 degrees F - 138 degrees F (38 degrees C - 59 degrees C).

(1) Blow dust and dirt from the support and movable arm with compressed air and clean the terminals with a fine grade (No. 000) sandpaper (item 4, App. C).

(2) Clean the relay mounting bracket screws and washers with cleaning solvent (item 1, App. C).

(3) Clean the contact cover, coil, armature and frame, contacts, springs, and overload heater with a clean, dry cloth.

(4) Inspect the insulation for cracks and other damage.

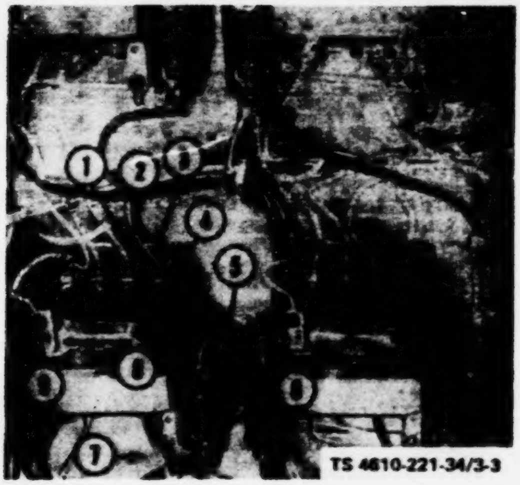
(5) Inspect the support and the armature relay for signs of overheating and cracks.

(6) Inspect the screws for damaged threads.

(7) Inspect the contact set for wear on contact points and for weak springs.

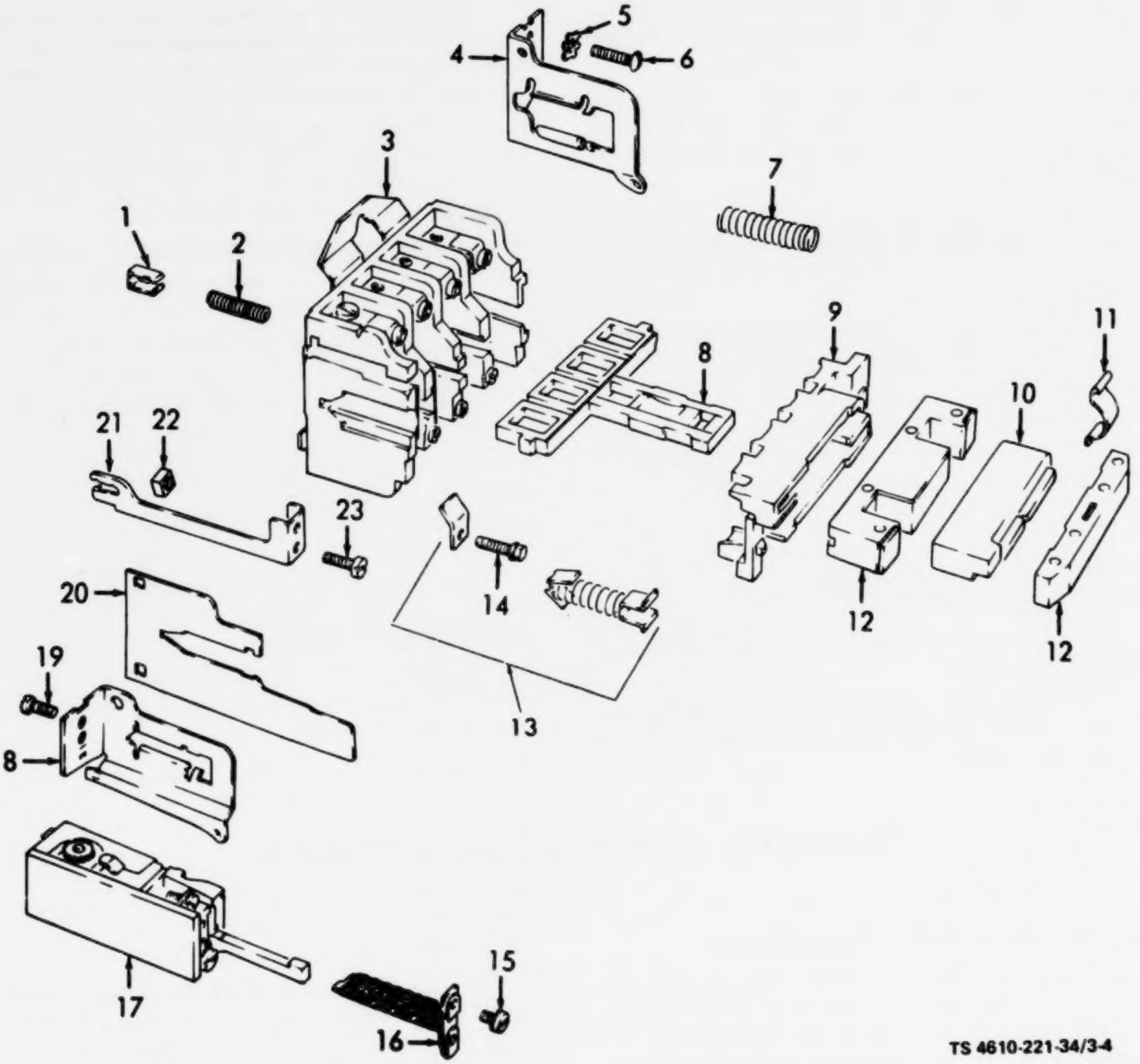
(8) Replace all unserviceable parts.

d. Reassembly and Installation.



1. Screw, machine, No. 10-32 x 5/8 in. (3)
2. Lockwasher, ET, No. 10 (3)
3. Motor starter
4. Terminal screw (8)
5. Overload relay (2)
6. Terminal screw (4)
7. Control cabinet
8. Adjusting knob (2)
9. Terminal screw

Figure 3-3. Motor Starter, Removal



TS 4610-221-34/3-4

1. Spring guide (2)
2. Coil retainer spring (2)
3. Support
4. Mounting bracket
5. Lockwasher, ET, No. 10 (3)
6. Screw, machine, pan hd, No. 10-32 x 5/8 in. (3)
7. Contact arm spring
8. Operating arm
9. Contact cover
10. Coil
11. Armature spring clip
12. Armature and frame
13. Contact set
14. Terminal screw (spec) (4)
15. Screw, machine, pan hd, No. 10-32 x 1/4 in. (4)
16. Overload heater (2)
17. Armature relay
18. Mounting bracket
19. Screw, machine, fil hd, No. 6-32 x 3/8 in. (2) (2)
20. Insulation (2)
21. Coil retainer (2)
22. Coil retainer nut (spec) (2)
23. Terminal screw (spec) (2)

Figure 3-4. Motor Starter, Exploded View

(1) Insert the two coil retainer springs (2, fig. 3-4) in the support (3) and secure the spring guides (1) to the coil retainer springs.

(2) Position the coil retainers (21) in the slot of the support (3) and insert the terminal screws (23) in the coil retainers and secure them with the coil retainer nuts (22).

(3) Position the armature relays (17) on the mounting brackets (4 and 18), with screw holes aligned with those of the brackets and secure with the screws (19).

(4) Position the overload heaters (16) in the armature relays (17) and secure them with the screws (15).

(5) Place an insulation (20) on each bracket (4 and 18) and position a bracket on each side of the support (3) by sliding the projections on the bracket into the slot in the support.

(6) Position the stationary contacts of the contact set (13) on the support (3) and secure them with the four terminal screws (14).

(7) Place the contact arm spring (7) into the operating arm (8).

(8) Place the movable contacts and springs of the contact set (13) into the openings in the operating arm (8).

(9) Position the operating arm (8) into the support (3) and slide the contact cover (9) on the operating arm (8) over the movable contacts, springs, and stationary contacts.

(10) Position the back half of the armature and frame (12) on the operating arm (8) and slide the coil (10) on the operating arm and the back half of the armature and frame (12).

(11) Position the front half of the armature and frame (12) on the operating arm (8) and replace the armature spring clip (11) in the slot.

(12) Install the motor starter (3, fig. 3-3) with the overload relay (5) inside the control cabinet (7) and secure with three lockwashers (2) and screws (1).

(13) Connect the electrical leads to the eight motor starter terminals (as previously tagged) and tighten the terminal screws (4) to secure.

(14) Connect the electrical leads to the four terminals of the overload relay (5) and secure with the terminal screws (6).

(15) Install the four remaining motor starters in a similar manner.

(16) Close the control cabinet door.

Section III. ELECTRICAL EQUIPMENT

3-4. Stepdown Power Transformer.

a. General. The stepdown transformer is mounted in the upper left-hand corner of the control cabinet. The stepdown transformer reduces the voltage delivered to the warning buzzer.

b. Removal.

(1) Open the control cabinet door.

(2) Remove the two nuts (2, fig. 3-5) and tag and disconnect the two electrical leads (3) from the stepdown transformer (8).

(3) Remove and tag the electrical leads from the warning buzzer toggle switch. Remove the two nuts and disconnect the electrical leads (9 and 10).

(4) Remove the four screws and lockwashers and remove the stepdown transformer (8) from the control cabinet.

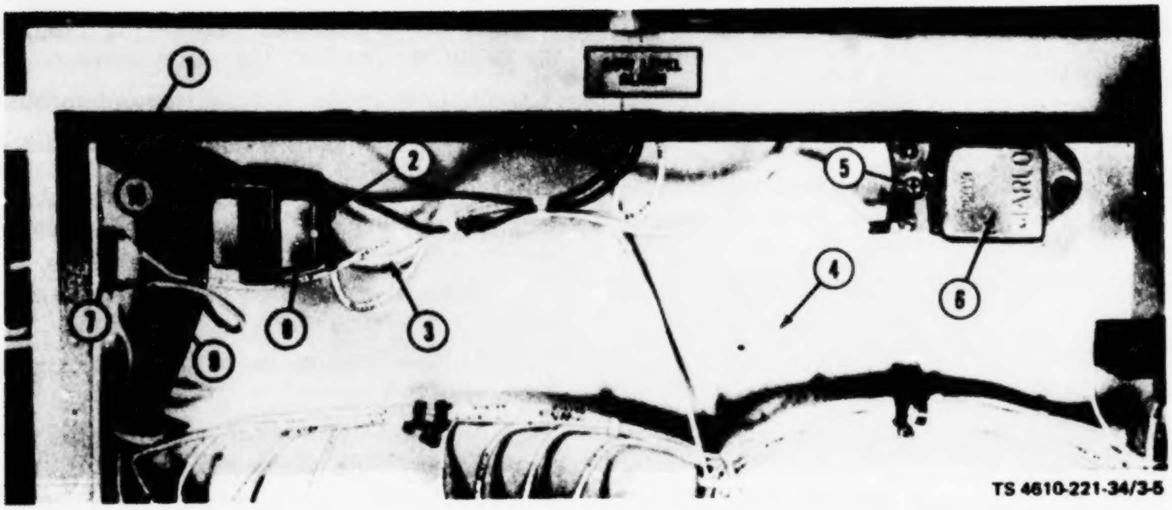
c. Testing.

(1) Test for continuity in the primary winding of the stepdown transformer using a multimeter set at the lowest ohm scale. Continuity must record on the multimeter. Set the multimeter at its highest ohm scale and test for grounds through the primary windings of the stepdown transformer.

(2) Test for continuity and grounds of the secondary winding of the stepdown transformer in a similar manner.

(3) Test for shorts between the primary winding and the secondary winding using a multimeter set at the highest ohm scale. The multimeter must not record continuity.

(4) Apply a source of 120 volt, 60 Hz alternating current to the primary windings and allow to remain for approximately 5 minutes. Check the transformer for heating.



TS 4610-221-34/3-5

1. Door gasket
2. Screw, 6-32 (4)
3. Electrical lead (2)
4. Control cabinet
5. Screw (2)
6. Warning buzzer
7. Warning buzzer toggle switch
8. Stepdown transformer
9. Electrical lead
10. Electrical lead

Figure 3-5. Stepdown Transformer, Removal

d. Cleaning and Inspection.

(1) Clean the stepdown transformer with a clean, dry cloth.

(2) Inspect the transformer for evidence of burned condition and apparent visible damage. Replace a defective stepdown transformer.

e. Installation.

(1) Install the stepdown transformer (8, fig. 3-5) in the control cabinet (4) and secure with the four screws and lockwashers.

(2) Connect and secure the two electrical leads (9 and 10).

(3) Connect the two electrical leads (3) to the stepdown transformer, as previously tagged, and secure with the two nuts (2).

(4) Close the control cabinet door.

3-5. Electrical Control Panel Cabinet.

a. Removal.

(1) Remove the motor starters (para 3-4).

(2) Remove the fuse (5, fig. 3-6).

(3) Remove the two terminal screws (2) and tag and disconnect the electrical leads (1) from the fuseholder (3).

(4) Remove the two screws (4) and remove the fuseholder (3) from the control cabinet (10).

(5) Remove the terminal screws (6) and tag and disconnect the electrical leads (9) from the terminal strip (8).

(6) Remove the two screws (11) and remove the terminal strip (8) from the control cabinet (10).

(7) Remove the two nuts (2, fig. 3-5) and tag and disconnect the electrical leads (3) from the warning buzzer (6).

(8) Remove the two screws (5) and remove the warning buzzer (6) from the control cabinet (4).

(9) Remove the stepdown transformer (para 3-4).

(10) Remove the knurled nut (2, fig. 3-7) and instruction plate (1) from the pushbutton (3) at the front of the control cabinet door (8) and remove the pushbutton and contact block (5, fig. 3-8) from the rear of the control cabinet door.

(11) Remove the other 11 START and STOP pushbuttons, contact blocks and instruction plates (1, 4, fig. 3-7) in a manner similar to that described above.

(12) Remove the four terminal screws (2, fig. 3-9) and tag and disconnect four electrical leads (4) from the circuit breaker (3).

(13) Remove the two screws (1) and remove the circuit breaker from the control cabinet.

(14) Remove the terminal board (para 3-6).

(15) Remove the two lockwashers (11, fig. 3-8), screws (10) and collars and remove the door handle from the outside of the control cabinet door and the door latch from inside the control cabinet door.

(16) Remove the other control cabinet door latch in a similar manner.

(17) Disconnect cables from control cabinet.

(18) Tag and disconnect all wires and harnesses in the control cabinet.

(19) Remove the two nuts (5, fig. 3-10) and lockwashers (4).

(20) Open the control cabinet and remove the two screws (6) from the bottom of the cabinet.

(21) Remove the two screws (8) and washers (7) from the back of the control cabinet and remove the control cabinet from the sludge concentrator tank.

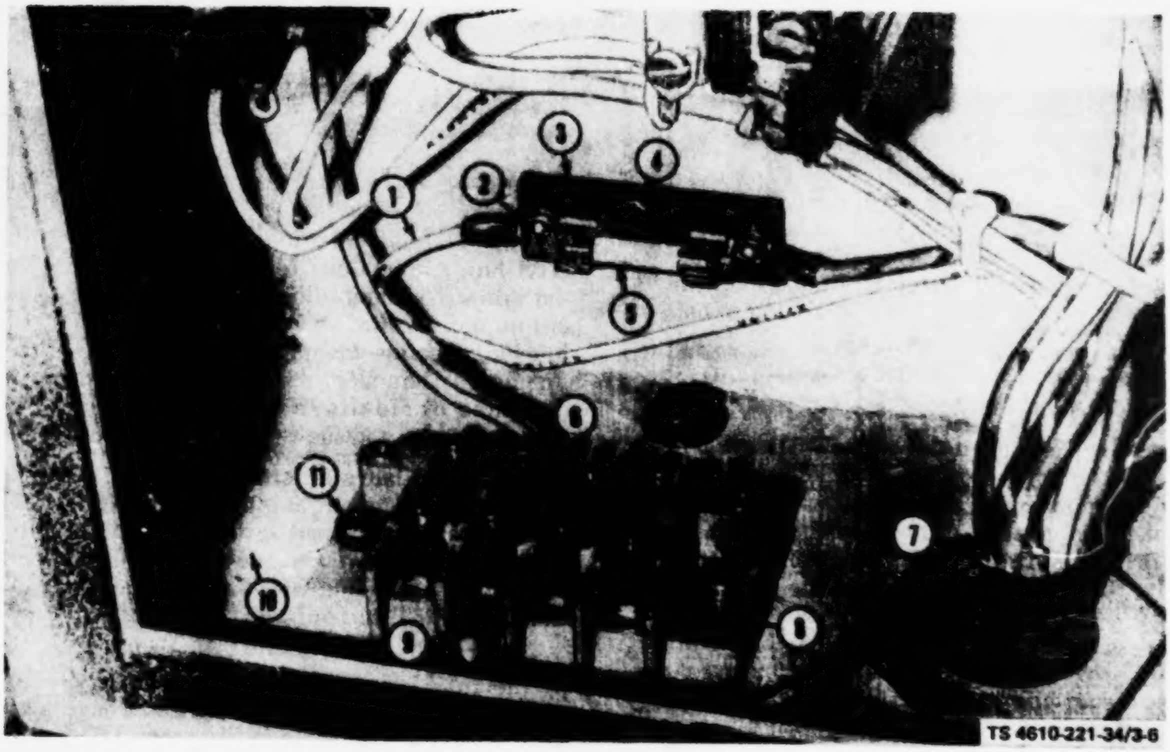
b. Cleaning and Inspection.

WARNING

Drycleaning solvent, P-D-680, used to clean parts is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Do not use near open flame or excessive heat. Flash point of solvent is 100 degrees F - 138 degrees F (38 degrees C - 59 degrees C).

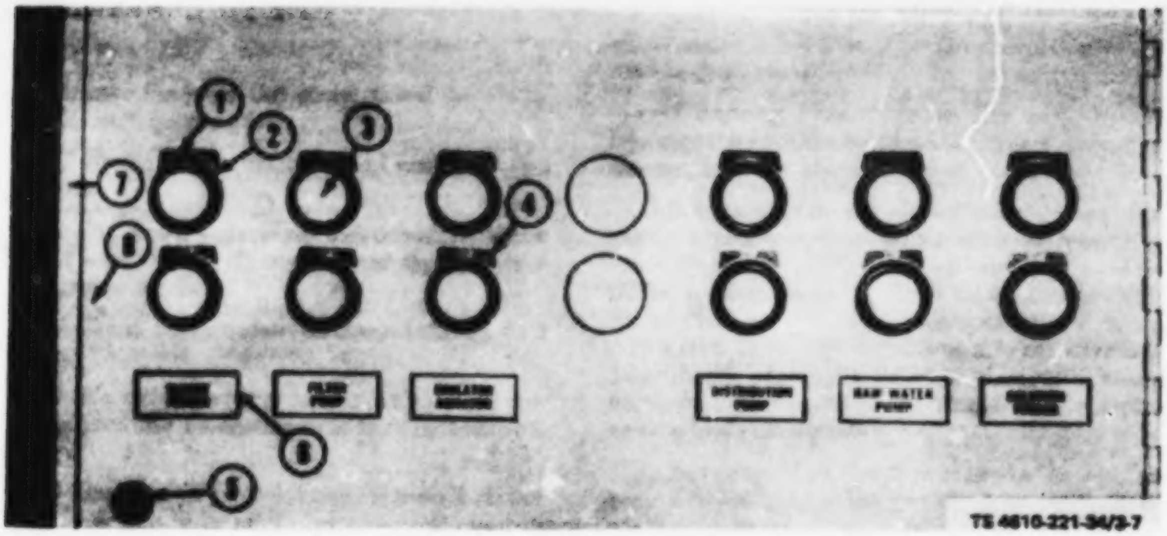
(1) Clean the control cabinet with cleaning solvent (item 1, App. C) and dry it with a clean cloth.

(2) Inspect the cabinet for cracks, breaks, dents, and other damage.


1
2
3
4
5
6
7
8
9
10
11
TS 4610-221-34/3-6

1. Electrical lead (2)
2. Terminal screw (2)
3. Fuse holder
4. Screw, machine, No. 8-32 x 5/8 in. (4)
5. Fuse, cartridge, 10 amp.
6. Terminal screw
7. Wiring harness
8. Terminal strip
9. Electrical lead
10. Control cabinet
11. Screw (2)

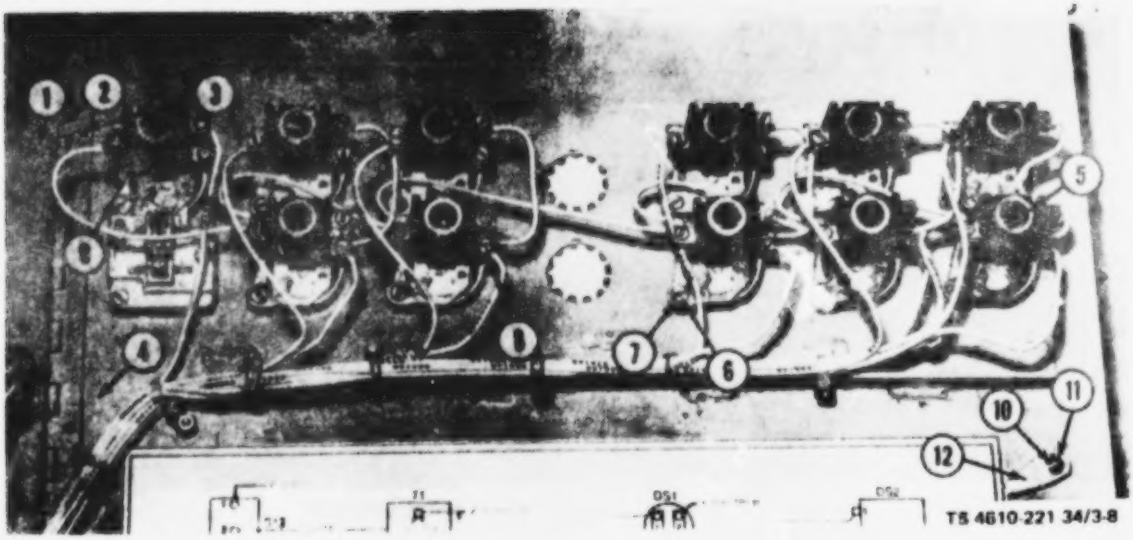
Figure 3-6. Fuse, Fuseholder, and Terminal Block, Removal


1
2
3
4
5
6
7
8
FILTER PUMP
DISTRIBUTION PUMP
RAW WATER PUMP

TS 4610-221-34/3-7

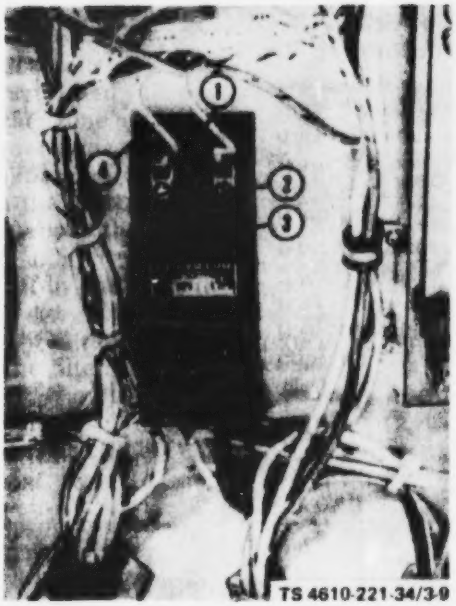
1. Instruction plate (START) (6)
2. Knurled nut (12)
3. Pushbutton (12)
4. Instruction plate (STOP) (6)
5. Door handle (2)
6. Identification label
7. Control cabinet
8. Control cabinet door

Figure 3-7. Start and Stop Pushbuttons, Removal


1
2
9
5
8
4
8
7
6
11
10
12
T1
DS1
DS2
TS 4610-221 34/3-8

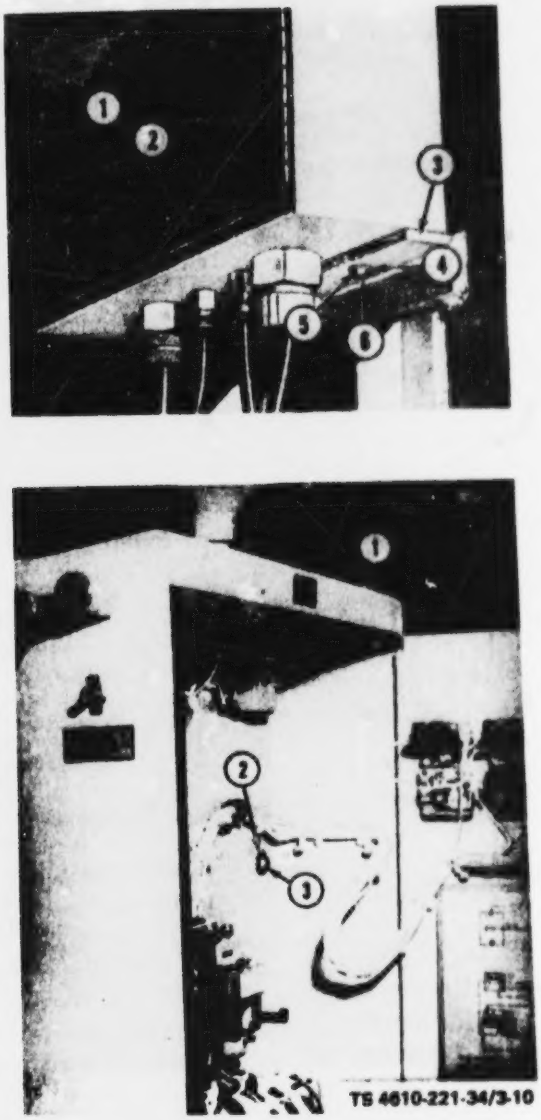
1. Control cabinet
2. Hinge
3. Rivet
4. Control cabinet door
5. Stop contact block (5)
6. Screw, machine, No. 8-32 x 5/8 in. (22)
7. Lockwasher, ET, No. 8 (22)
8. Terminal screw (22)
9. Start contact block (6)
10. Screw
11. Lockwasher
12. Latch

Figure 3-8. Start and Stop Contact Blocks, Removal


①
④
②
③
TS 4610-221-34/3-9

1. Screw
2. Terminal screw (4)
3. Circuit breaker
4. Electrical lead (4)

Figure 3-9. Circuit Breaker, Removal


1
2
3
4
5
6
1
2
3
TS 4610-221-34/3-10

1. Latch, door
2. Control cabinet
3. Support
4. Lockwasher, 5/16 in. (7)
5. Nut, hex, 5/16-18 (7)
6. Screw, cap
7. Washer, lock, 1 1/16 in. (6)
8. Screw, cap, hex hd, 3/8-16 x 1/2 in. (2)

Figure 3-10. Control Cabinet, Removal

(3) Straighten minor dents and bends and weld small cracks and breaks. Replace the cabinet if it is damaged beyond repair.

c. Installation.

(1) Position the control cabinet on the support (3, fig. 3-10) and secure the cabinet to the sludge concentrator tank with screws (8) and washers (7).

(2) Secure the cabinet to the support (3) with screws (6) and washers (4) and nuts (5).

(3) Reconnect all wires and harnesses in the control cabinet.

(4) Connect the cables to control cabinet.

(5) Install the door latch in the rear of the control cabinet door. Position the door handle on the front of the control cabinet door latch with the two lockwashers (11, fig. 3-8) screws (10) and collars.

(6) Install the other control cabinet door latch in a similar manner.

(7) Install the terminal board (para 3-6).

(8) Install the circuit breaker (3, fig. 3-9) in the control cabinet and secure with the two screws (1).

(9) Connect the four electrical leads (4) to the circuit breaker (3) (as previously tagged) and secure with the four screws (2).

(10) Position the pushbutton (3, fig. 3-7) through the rear of the control cabinet door (8), install the instruction plate (1) on the front of the pushbutton, and secure with the knurled nut (2).

(11) Install the other 11 START and STOP pushbuttons, contact blocks (5, fig. 3-8) and instruction plates (1, 4, fig. 3-7) in a similar manner.

(12) Install the stepdown transformer (para. 3-4).

(13) Position the warning buzzer (6, fig. 3-5) inside the control cabinet (4) and secure with screws (5).

(14) Connect the two electrical leads (3) to the warning buzzer, as previously tagged, and secure with two nuts (2).

(15) Position the terminal strip (8, fig. 3-6) in the bottom of the control cabinet (10) and secure with the two screws (11).

(16) Connect the electrical leads (9) to th terminal strip, as previously tagged, and secur with the terminal screws (6).

(17) Install the fuseholder (3) in the control cabinet (10) and secure with the two screws (4).

(18) Connect the electrical leads (1) to th fuseholder (as previously tagged) and secure with two terminal screws (2).

(19) Install the fuse (5).

(20) Install the motor starter (para 3-4).

3-6. Terminal Board Assembly.

a. General. The terminal board assembly, located in the lower right corner of the control cabinet, provides a central point for connecting the outside 110 volt power source to the various components of the water purification unit.

b. Removal.

(1) Open the control cabinet door.

(2) Loosen the nuts of the four terminal lugs (7, fig. 3-11) and disconnect the power cable (8).

(3) Remove the 26 screws (4) and lockwashers (3) and tag and disconnect the electrica leads (5) from the bus bars (6).

(4) Remove the four screws (10) and lockwashers (9) and remove the terminal panel (11) from the control cabinet.

(5) Remove, from the rear of each terminal lug (7), the screw and lockwasher that secure each terminal lug. Remove the four terminal lugs from the terminal panel.

(6) Remove the four screws (2) and lockwashers (3) and remove the bus bars from the terminal panel.

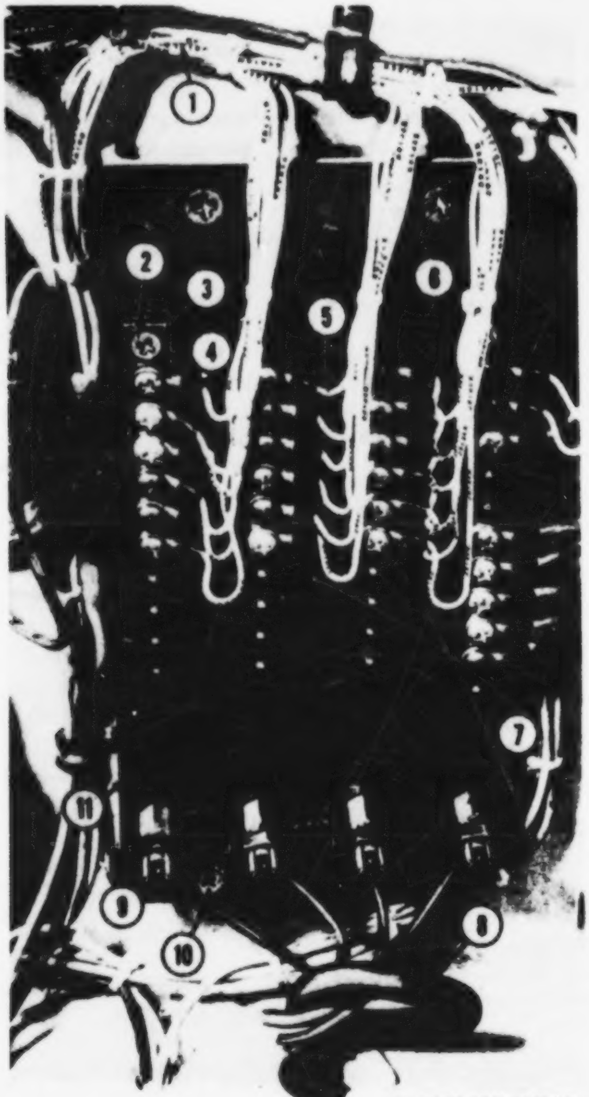
c. Cleaning and Inspection.

(1) Clean the terminal panel, bus bars, terminal lugs, and attaching screws with a clean, dry cloth. Clean corrosion from electrical contact surfaces.

(2) Inspect the terminal panel, bus bars, and terminal lugs for distortion, breaks, and damaged threads. Replace an unserviceable terminal panel, terminal lug, or bus bar.

d. Installation.

(1) Position the bus bars on the terminal


1
2
3
4
5
6
7
11
9
10
8
TS 4610-221-34/3-11

1. Wiring harness
2. Screw, machine, 1/4-20 x 1 in. (4)
3. Washer, lock ET, 1/4 in. (4)
4. Screw, machine, 1/4-20 x 1/2 in. (26)
5. Electrical lead (26)
6. Bus bar
7. Terminal lug (4)
8. Power cable
9. Lockwasher (4)
10. Screw, machine (4)
11. Terminal panel

Figure 3-11. Terminal Board Assembly. Removal

panel (11, fig. 3-11) and secure with the four lockwashers (3) and screws (2).

(2) Install the four terminal lugs (7) in the terminal panel (11) and secure at the rear with the four lockwashers and screws.

(3) Install the terminal panel (11) in the control cabinet and secure with the four lockwashers (9) and screws (10).

(4) Connect the 26 electrical leads (5) to the bus bars, as tagged, and secure with the lockwashers (3) and screws (4).

(5) Connect the power cable (8) to the four terminal lugs (7). Tighten the nuts of the terminal lugs to secure the electrical leads and power cable.

(6) Close the control cabinet door.

3-7. Wiring.

a. General. All instruments and controls in the electrical system are connected in the proper circuit by a wiring harness in the control cabinet. Other electrical wiring runs through the cable.

b. Inspection, Testing, Repair, and Replacement.

(1) Inspection. Inspect insulation for cracked and frayed material. Pay particular attention to wiring passing through the van body. If inspection reveals a broken or cut wire and the break in the wire is exposed and readily accessible, repair the wire as described in (3) below. If a break in a wire is in a wiring harness or in the cable, replace the wire as directed in (4 below.

(2) Testing. Test for continuity by disconnecting each end of the wire from the component to which it is attached. Touch the probes of a test lamp to each end of the wire. If t lamp does not light, the wire is defective. Rep or replace a defective wire.

(3) Repair. If a break in a wire passing through the van body or through the cable is readily accessible, shave away insulation on the wire to expose one-half inch of bare wire at both ends of the break. Twist the bare wires together and solder the connections. Cover the repaired cut by wrapping electrical tape over the entire area. Do not leave any bare wire exposed. If a receptacle connector breaks off the end of a wire or cable, replace it by using a wire terminal repair kit.

(4) Replacement. If the break in a wire is not readily accessible and cannot be repaired, replace the cable. If a wire is part of a wiring harness and is defective, disconnect both ends and cover the ends with electrical tape. Install a new wire of the same size and attach it to the outer side of the wiring harness. If a complete re wiring is necessary, install wires of the sam size in accordance with the wiring diagram. Where a harness has been used, rewire by using the old harness as a pattern.

NOTE

Be sure to identify a new wire with the same identification number of the one removed.

Section IV. WATER PURIFICATION

3-8. Chemical Slurry Feeder Assembly.

a. General. The slurry feeder assembly consists essentially of a cast-aluminum tank that is supported by a welded frame, agitators with measuring cups, rate-of-discharge regulators, and a safety clutch. The slurry feeder assembly is vertically divided into two watertight compartments of equal size. Each compartment has four agitators with two measuring cups attached to diametrically opposed agitators, a watertight clear plastic window, liquid level indicators, collecting funnels, filling connections, and a rate-of-discharge controller. The agitators of both compartments rotate vertically from a common shaft with each compartment operating as a separate unit to provide two different chemical slurries to be mixed and fed at the same time.

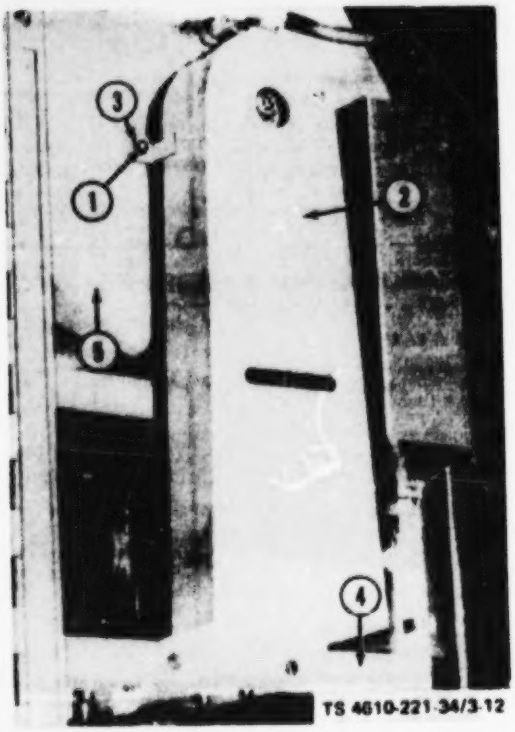
b. Removal.

(1) Disconnect the raw water piping and filter water piping and remove the drain and control valves from the slurry feeder assembly.

(2) Remove the two nuts, four lockwashers (3, fig. 3-12), and four capscrews (1) and remove the chain guard (2) from the slurry feeder assembly (5) and slurry feeder frame (4).

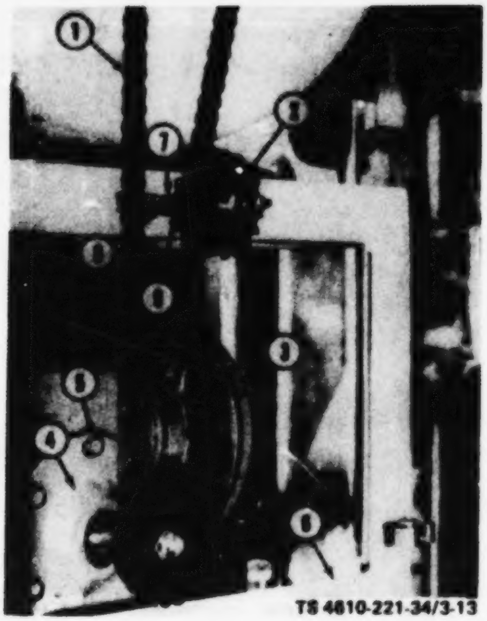
(3) Loosen the nut (7, fig. 3-13) to relieve the tension on the drive chain (1).

(4) Remove the master link from the drive chain (1) and remove the drive chain.


3
1
2
5
4
TS 4610-221-34/3-12

1. Screw, cap, hex hd, 1/4-20 (4)
2. Chain guard
3. Lockwasher, 1/4 in. (4)
4. Slurry feeder frame
5. Slurry feeder assembly

Figure 3-12. Chain Guard, Removal



1. Drive chain
2. Chain tightener assembly
3. V-belt
4. Slurry feeder gear assembly
5. Screw, cap, 3/8-16 x 1 1/4 in. (6)
6. Slurry feeder frame
7. Nut, hex, 1/2 in.
8. Washer, flat, 0.521 - 0.541 id x 1.062 od (2)
9. Lockwasher, 1/2 in.

Figure 3-13. Drive Chain, Removal

(5) Remove the setscrew (4, fig. 3-14) from the collar (1) and remove the collar from the slurry feeder agitator shaft (2).

(6) Remove the disks and hub portion (5 through 14, fig. 3-15) of the slip clutch assembly (8, fig. 3-14) and the key (7, fig. 3-15) from the slurry feeder agitator shaft (2, fig. 3-14).

(7) Remove the clutch housing (5) with attached sprocket (7) and the fiber washer (1, fig. 3-15) from the slurry feeder agitator shaft.

(8) Remove the lubrication fitting (3, fig. 3-14) from the slurry feeder agitator shaft (2).

(9) For ETC Model S1500 only, remove the setscrew (9, fig. 3-16) from the slip clutch assembly and remove the assembly from the slurry feeder agitator shaft.

(10) Loosen the pipe bushing (6, fig. 3-17) and disconnect the plastic tube (8) from the ejector (5).

(11) Loosen the tube nut (3) that secures the copper tube (4) to the ejector (5) and disconnect the copper tube.

(12) Remove the ejector (5) from the slurry feeder assembly (7).

(13) Loosen the hose clamp (12, fig. 3-18) and disconnect the plastic tube from the diatomite dilution tank (16).

(14) Loosen the hose clamp (15) and disconnect the plastic tube (14) from the bottom of the diatomite dilution tank (16).

(15) Remove the two nuts, lockwashers, and capscrews (18) and remove the diatomite dilution tank (16) from the slurry feeder (4).

(16) Remove the four nuts (3, fig. 3-19), lockwashers (2), and capscrews (4) and remove the slurry feeder assembly (1) from the slurry feeder frame (5).

c. *Disassembly.*

(1) Remove the two nuts (5, fig. 3-20), lockwashers (6), and shoulder screws (7) and remove the charging door (8) from the slurry feeder housing (1).

(2) Remove the screw (14), lockwasher (13), and washer (12) and separate the latch (11), two washers (10), and knob (9) from the charging door (8).

(3) Remove the other latch (11), knob (9), and washers (10) in a similar manner.

(4) Remove the two cotter pins (16) and remove the door support rod (15) from the slurry feeder housing (1).

(5) Remove the 16 nuts (31), lockwashers (32), and capscrews (19) and remove a window frame (18), two window gaskets (20), and a window (21) from a slurry feeder housing (1).

(6) Remove the other window (21) in a similar manner.

(7) Remove the two drive screws (24) and remove the quadrant indicator (23) from the slurry feeder housing (1).

(8) Remove the handwheel (27) and washer (25) from the stud (26).

(9) From inside the slurry feeder housing, remove the nut (30) from the stud (26) and remove the stud.

(10) From inside the slurry feeder housing, remove the setscrew (28) and separate the cover assembly (22) from the quadrant (29).

(11) Remove the other quadrant indicator (23), knob (9), stud (26), cover assembly (22), and quadrant (29) in a similar manner to that described above.

(12) Remove the 10 screws (3) and lockwashers (2) and remove the cover plate (4) from the slurry feeder housing (1).

(13) Remove the eight nuts, lockwashers, and capscrews (3, fig. 3-21) and remove the two arm assemblies (2) from the slurry feeder shaft (10) through the opening in the top of the slurry feeder housing.

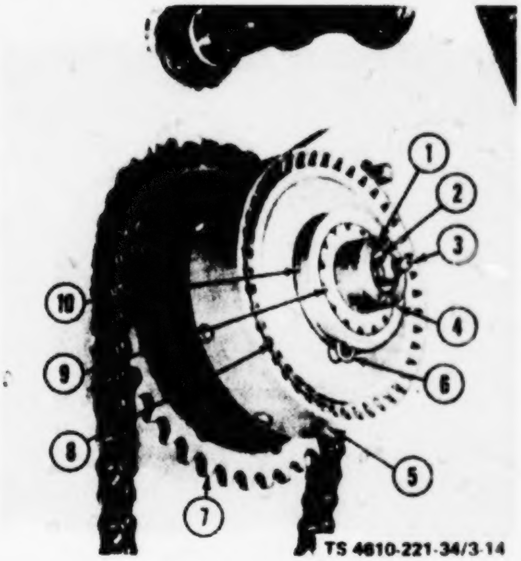
(14) Remove the two capscrews (9, fig. 3-22) and lockwashers (8) and remove the cup (1) from the cup cover (10).

(15) Remove the screen (11) from the cup (1).

(16) Remove the orifice plug (12) from the cup cover (10).

(17) Remove the four capscrews (6) and lockwashers (5) and remove the cup cover (10) from the filler (7).

(18) Remove the four capscrews (13 and 14), nuts (4), and lockwashers (5) and remove the two plows (2) and the filler (7) from the arm (3).

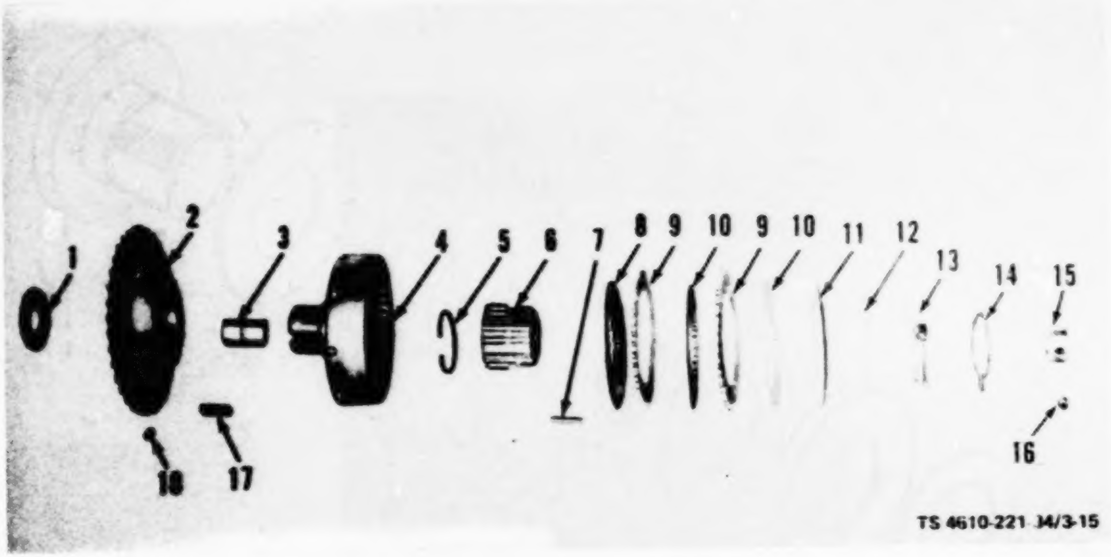


NOTE

THIS FIGURE IS NOT APPLICABLE TO ETC MODEL S1500

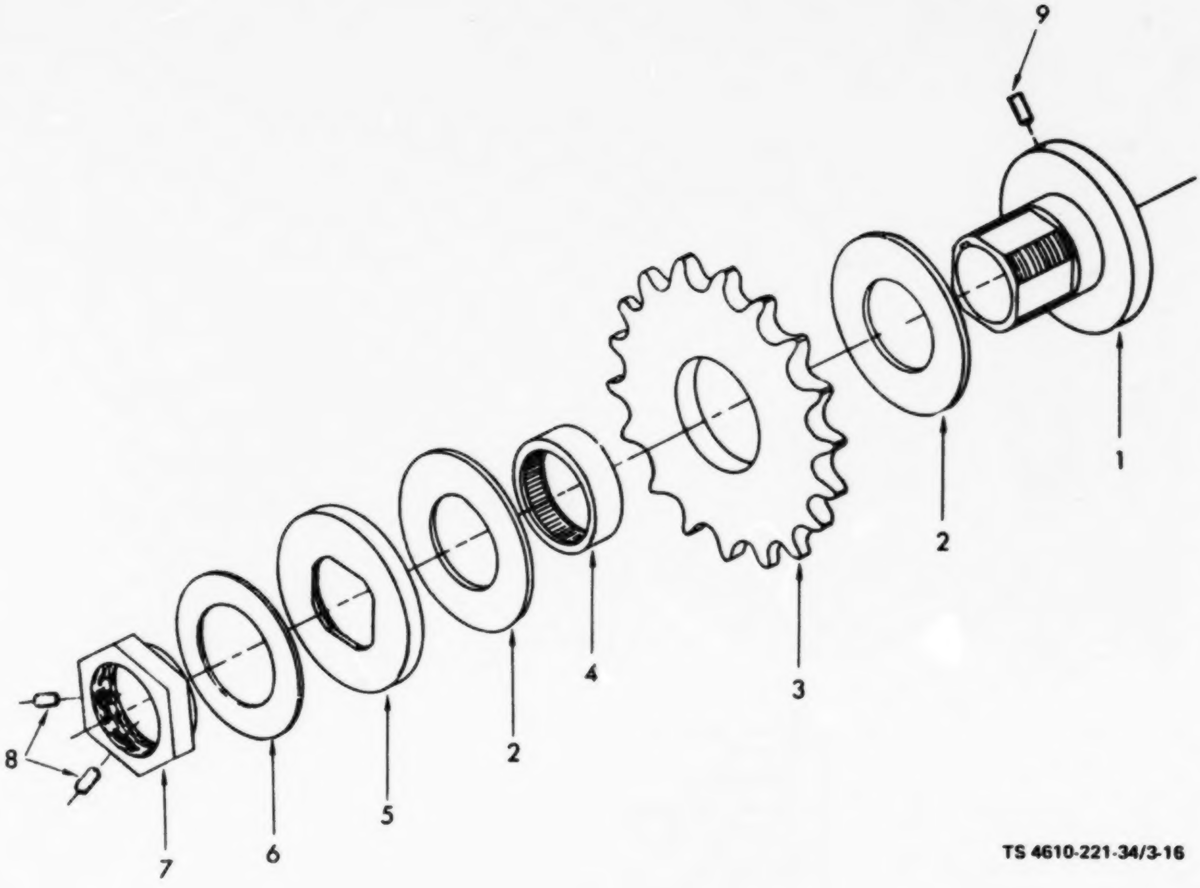
1. Collar
2. Slurry feeder, agitator shaft
3. Lubrication fitting
4. Setscrew, 5/16-18 x 1/4 in.
5. Clutch housing
6. Lockwire
7. Sprocket
8. Slip clutch assembly
9. Drive hub
10. Adjusting nut

Figure 3-14. Slip Clutch Assembly, Removal


1
2
3
4
5
6
7
8
9
10
9
10
11
12
13
14
15
16
18
17
TS 4610-221-34/3-15

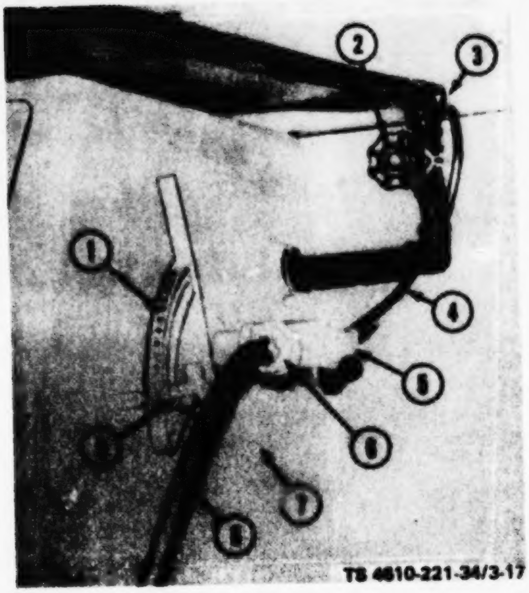
1. Fiber washer
2. Sprocket
3. Bushing (2)
4. Clutch housing
5. Hub lockring
6. Drive hub
7. Key, machine, 3/17 x 1 1/8 in.
8. Backplate
9. Housing plate (2)
10. Hub plate (2)
11. Pressure ring
12. Spring
13. Adjusting nut
14. Lockwire
15. Collar
16. Setscrew, 5/16-18 x 1/4 in.
17. Key, machine 1/4 x 7/8 in.
18. Setscrew, 5/16-18 x 5/8 in. (2)

Figure 3-15. Slip Clutch Assembly, Exploded View (MET-PRO Model 1500-2600A)


9
1
2
3
4
2
5
6
7
8
TS 4610-221-34/3-16

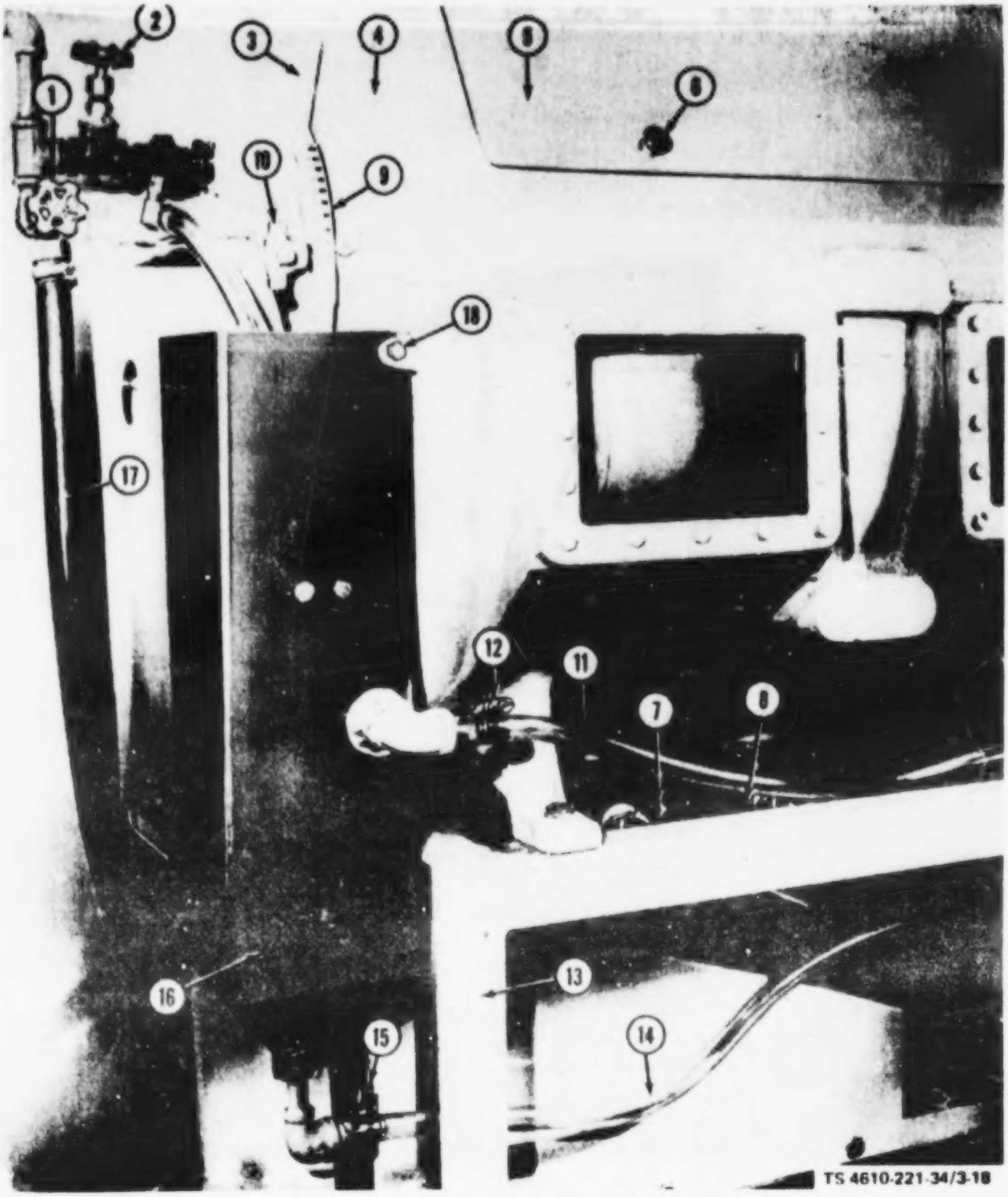
1. Hub
2. Fiber
3. Sprocket
4. Bearing
5. Plate
6. Spring
7. Nut
8. Setscrew
9. Setscrew

Figure 3-16. Slip Clutch Assembly, Exploded View (ETC Model S1500)


2
3
1
4
5
6
9
7
8
TS 4610-221-34/3-17

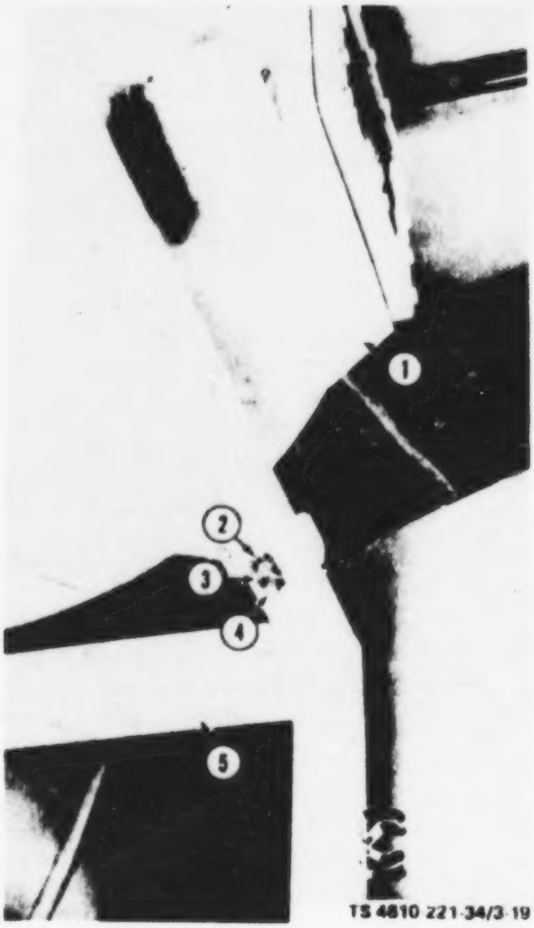
1. Limestone slurry feed variator (FEI-6)
2. Control valve (CV-8)
3. Nut, tube, 3/8 in. (2)
4. Copper tube
5. Ejector
6. Bushing, pipe, 1/2 x 1 in.
7. Slurry feeder assembly
8. Plastic tube
9. Knob, locking

Figure 3-17. Ejector, Removal


1
2
3
4
5
6
9
10
18
17
12
11
7
8
13
16
15
14
TS 4610-221-34/3-18

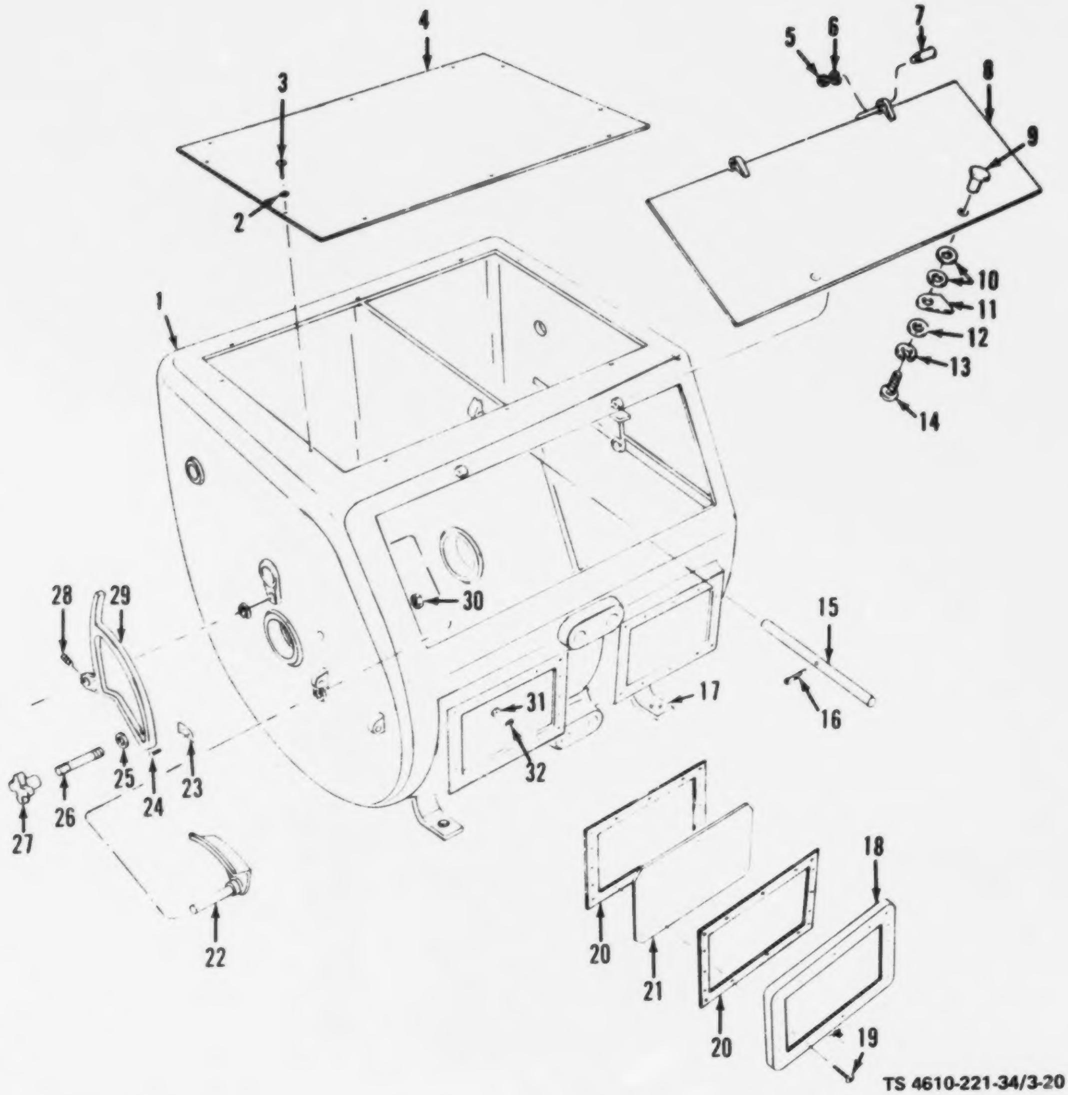
1. Control valve (CV-33)
2. Control valve (CV-32)
3. Diatomite slurry feeder variator (FEI-5)
4. Slurry feeder assembly
5. Charging door
6. Latch (2)
7. Drain valve (DV-26)
8. Drain valve (DV-27)
9. Variator scale
10. Locking knob
11. Plastic tube
12. Hose clamp
13. Slurry feeder frame
14. Plastic tube
15. Hose clamp
16. Diatomite dilution tank
17. Hose, 6 ft.
18. Screw, cap, 1/4-20 x 1 1/4 inch (3)

Figure 3-18. Diatomite Dilution Tank, Removal


1
2
3
4
5
TS 4610 221-34/3-19

1. Slurry feeder assembly
2. Lockwasher, 1/2 in. (4)
3. Nut, plain, hex, 1/2-13 (4)
4. Screw, cap, 1/2-13 x 1 3/4 in. (4)
5. Slurry feeder frame

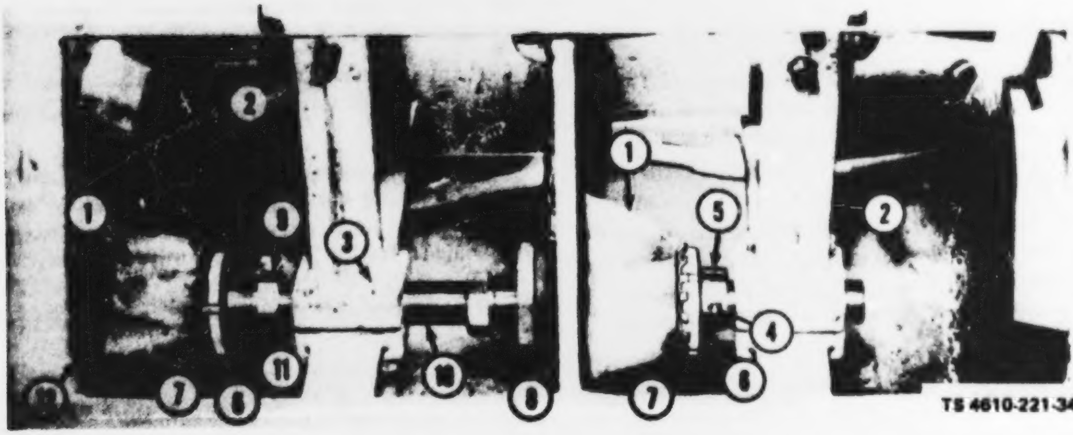
Figure 3-19. Slurry Feeder Assembly, Removal



TS 4610-221-34/3-20

1. Slurry feeder housing
2. Lockwasher, No. 12 (10)
3. Screw, machine, No. 12-25 x 1 3/8 in. (2)
4. Cover plate
5. Nut, plain, hex, No. 10-24 x 1 3/8 in. (2)
6. Washer, lock, No. 10 (2)
7. Screw, shoulder, No. 10-24 x 1 3/8 in. (2)
8. Charging door
9. Knob (2)
10. Washer, flat, 1/2 in. (4)
11. Latch (2)
12. Washer, flat, No. 8 (2)
13. Lockwasher, No. 8 (2)
14. Screw, machine, No. 8-32 x 3/8 in. (2)
15. Door support rod
16. Pin, cotter, 1/8 x 3/4 in. (2)
17. Support
18. Window frame (2)
19. Screw, cap, 1/4-20 x 1 1/2 in. (32)
20. Window gasket (4)
21. Window (2)
22. Cover assembly (2)
23. Quadrant indicator (2)
24. Screw, drive, No. 4 x 3/16 in. (4)
25. Washer, flat, 3/8 in. (2)
26. Stud, plain, 3/8-16 x 1 1/2 in. (2)
27. Handwheel (2)
28. Setscrew, 1/4-20 x 3/8 in. (2)
29. Quadrant (2)
30. Nut, plain, hex, 3/8-16 (2)
31. Nut, plain, hex, 1/4-20 (32)
32. Lockwasher, 1/4 in. (32)

Figure 3-20. Slurry Feeder Assembly, Exploded View



TS 4610-221-34/3-21

1. Bearing cage
2. Arm assembly (2)
3. Screw, cap, stainless steel, 3/8-16 x 2 1/2 in. (4)
4. Setscrew, 1/4-20 x 1/4 in.
5. Shaft collar
6. Locknut (spec) (2)
7. Washer (spec) (2)
8. Inner bearing
9. Nut, hex, bronze, 1 5/8-18 (2)
10. Slurry feeder shaft
11. Outer bearing
12. Liquid level indicator

Figure 3-21. Slurry Feeder Agitator, Removal

(19) Disassemble the other three arm assemblies in a similar manner to that described above.

(20) Remove the setscrew (4, fig. 3-21) and slide the collar (5) off the slurry feeder shaft (10).

(21) Pry the teeth of the washer (7) away from the locknut (6) and remove the locknut and washer from the inner bearing (8).

(22) Pry the teeth of the other washer (7) away from the locknut (6) and remove the locknut and washer from the outer bearing (11). Allow the locknut and washer to hang loosely on the slurry feeder shaft (10).

(23) Unscrew the nuts (9) from the inner bearing (8) and the outer bearing (11) and slide a spring (8, fig. 3-23), washer (7), and packing (6) from within each bearing back along the slurry feeder shaft.

(24) Pull the slurry feeder shaft (11) out of the slurry feeder housing. Remove the packings (6), washers (7), springs (8), nuts (9), locknut (5), washer (4), preformed packing (3), and inner and outer bearings (2 and 12) as the slurry feeder shaft is being pulled out of the housing.

d. Cleaning and Inspection.

WARNING

Drycleaning solvent, P-D-680, used to clean parts is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Do not use near open flame or excessive heat. Flash point of solvent is 100 degrees F - 138 degrees F (38 degrees C - 59 degrees C).

(1) Clean all metal parts of the slurry feeder tank with cleaning solvent (item 1, App. C) and flush thoroughly with clean water. A wire brush may be used to aid removal of mineral deposits. Pay particular attention to cleaning the screens and orifice plugs.

(2) Clean the plastic windows with a solution of soap and warm water and rinse thoroughly with clean water.

(3) Inspect the plastic windows for cracks, breaks, scratched surfaces, and discoloration. Replace a damaged or defective window.

(4) Inspect the inner and outer bearings for scored or burned bearing surfaces and damaged threads. Replace a damaged bearing.

(5) Inspect the slurry feeder shaft for scored or burned bearing surfaces, damaged threads, and a restricted oil passage. Remove any restriction from the oil passage with a length of wire and compressed air. Replace the slurry feeder shaft if damaged.

(6) Inspect the packings for a dried-out or deteriorated condition. Replace a damaged packing.

(7) Inspect all the cast-aluminum parts of the slurry feeder tank for cracks, breaks, damaged threads, and pinhole leaks. Weld cracks and pinhole leaks in any aluminum part and retap any damaged threads to an oversize, if it is practical. Replace any aluminum part that is unserviceable.

e. Reassembly.

(1) Install the inner and outer bearings (12 and 2) with the two preformed packings (3) in the bearing cages (1, fig. 3-21) of the slurry feeder housing. Secure each bearing with a washer (7) and locknut (6). Bend the teeth of the washer up to retain the locknut.

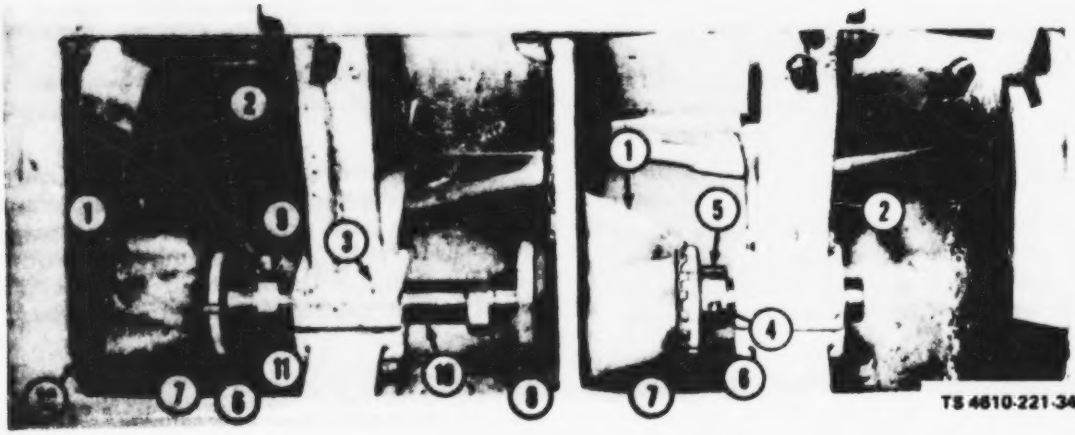
(2) Insert the slurry feeder shaft (10) part way into the first compartment of the slurry feeder housing.

(3) Install the following items in the given order on the slurry feeder shaft: a washer (7, fig. 3-23), a spring (8), two nuts (9) placed back-to-back, a spring (8), and a washer (7).

(4) Insert the slurry feeder shaft (11) into the other compartment of the slurry feeder housing. Install the collar (13) on the end of the slurry feeder shaft and secure with the setscrew (14).

(5) Install the packing (6) around the slurry feeder shaft (11) and inside the inner and outer bearings (12 and 2). Screw the nuts (9) into the bearings to secure the packing.

(6) Adjust tension on the packing by tightening or loosening the nuts (9) until a slight drag is felt while turning the slurry feeder shaft by hand.



TS 4610-221-34/3-21

1. Bearing cage
2. Arm assembly (2)
3. Screw, cap, stainless steel, 3/8-16 x 2 1/2 in. (4)
4. Setscrew, 1/4-20 x 1/4 in.
5. Shaft collar
6. Locknut (spec) (2)
7. Washer (spec) (2)
8. Inner bearing
9. Nut, hex, bronze, 1 5/8-18 (2)
10. Slurry feeder shaft
11. Outer bearing
12. Liquid level indicator

Figure 3-21. Slurry Feeder Agitator, Removal

(19) Disassemble the other three arm assemblies in a similar manner to that described above.

(20) Remove the setscrew (4, fig. 3-21) and slide the collar (5) off the slurry feeder shaft (10).

(21) Pry the teeth of the washer (7) away from the locknut (6) and remove the locknut and washer from the inner bearing (8).

(22) Pry the teeth of the other washer (7) away from the locknut (6) and remove the locknut and washer from the outer bearing (11). Allow the locknut and washer to hang loosely on the slurry feeder shaft (10).

(23) Unscrew the nuts (9) from the inner bearing (8) and the outer bearing (11) and slide a spring (8, fig. 3-23), washer (7), and packing (6) from within each bearing back along the slurry feeder shaft.

(24) Pull the slurry feeder shaft (11) out of the slurry feeder housing. Remove the packings (6), washers (7), springs (8), nuts (9), locknut (5), washer (4), preformed packing (3), and inner and outer bearings (2 and 12) as the slurry feeder shaft is being pulled out of the housing.

d. Cleaning and Inspection.

WARNING

Drycleaning solvent, P-D-680, used to clean parts is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Do not use near open flame or excessive heat. Flash point of solvent is 100 degrees F - 138 degrees F (38 degrees C - 59 degrees C).

(1) Clean all metal parts of the slurry feeder tank with cleaning solvent (item 1, App. C) and flush thoroughly with clean water. A wire brush may be used to aid removal of mineral deposits. Pay particular attention to cleaning the screens and orifice plugs.

(2) Clean the plastic windows with a solution of soap and warm water and rinse thoroughly with clean water.

(3) Inspect the plastic windows for cracks, breaks, scratched surfaces, and discoloration. Replace a damaged or defective window.

(4) Inspect the inner and outer bearings for scored or burned bearing surfaces and damaged threads. Replace a damaged bearing.

(5) Inspect the slurry feeder shaft for scored or burned bearing surfaces, damaged threads, and a restricted oil passage. Remove any restriction from the oil passage with a length of wire and compressed air. Replace the slurry feeder shaft if damaged.

(6) Inspect the packings for a dried-out or deteriorated condition. Replace a damaged packing.

(7) Inspect all the cast-aluminum parts of the slurry feeder tank for cracks, breaks, damaged threads, and pinhole leaks. Weld cracks and pinhole leaks in any aluminum part and retap any damaged threads to an oversize, if it is practical. Replace any aluminum part that is unserviceable.

e. Reassembly.

(1) Install the inner and outer bearings (12 and 2) with the two preformed packings (3) in the bearing cages (1, fig. 3-21) of the slurry feeder housing. Secure each bearing with a washer (7) and locknut (6). Bend the teeth of the washer up to retain the locknut.

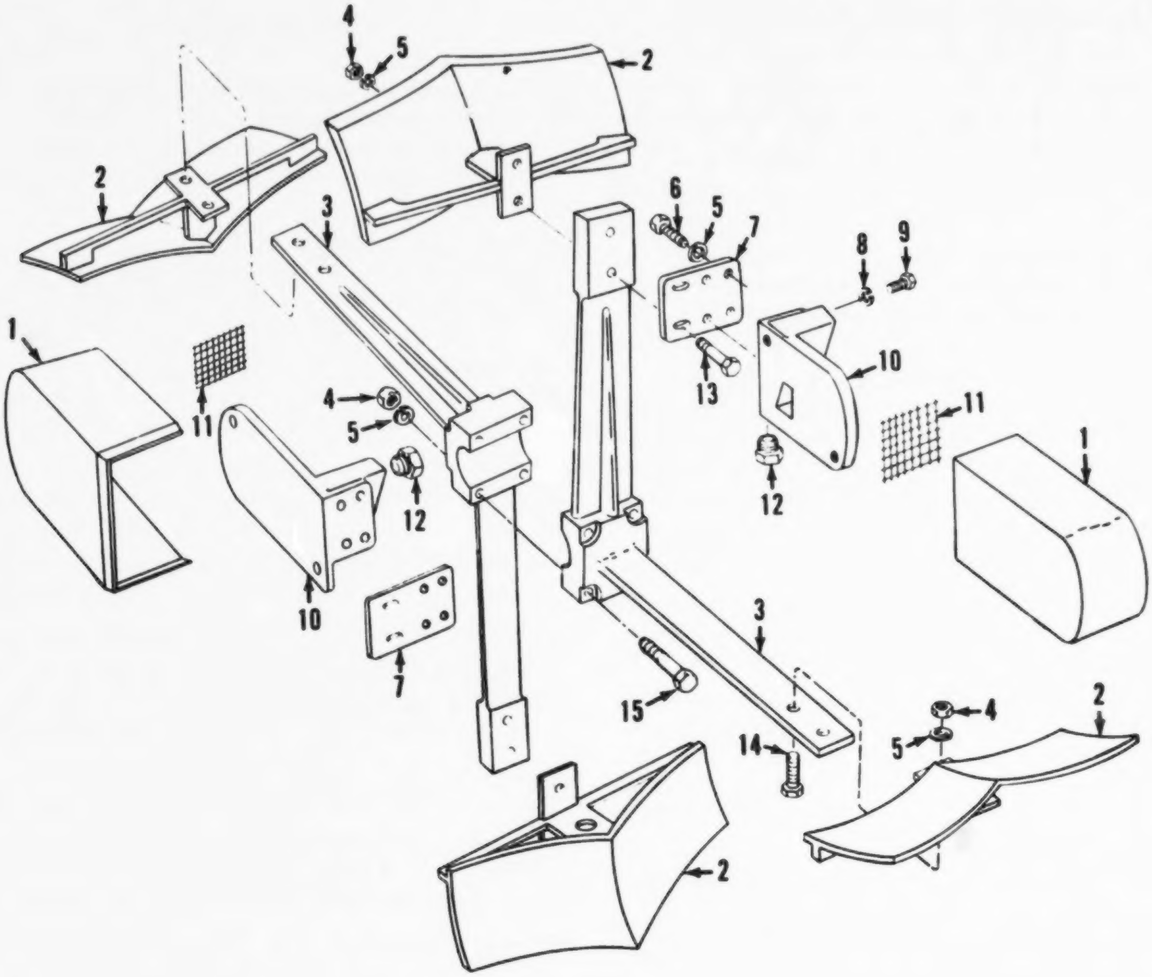
(2) Insert the slurry feeder shaft (10) part way into the first compartment of the slurry feeder housing.

(3) Install the following items in the given order on the slurry feeder shaft: a washer (7, fig. 3-23), a spring (8), two nuts (9) placed back-to-back, a spring (8), and a washer (7).

(4) Insert the slurry feeder shaft (11) into the other compartment of the slurry feeder housing. Install the collar (13) on the end of the slurry feeder shaft and secure with the setscrew (14).

(5) Install the packing (6) around the slurry feeder shaft (11) and inside the inner and outer bearings (12 and 2). Screw the nuts (9) into the bearings to secure the packing.

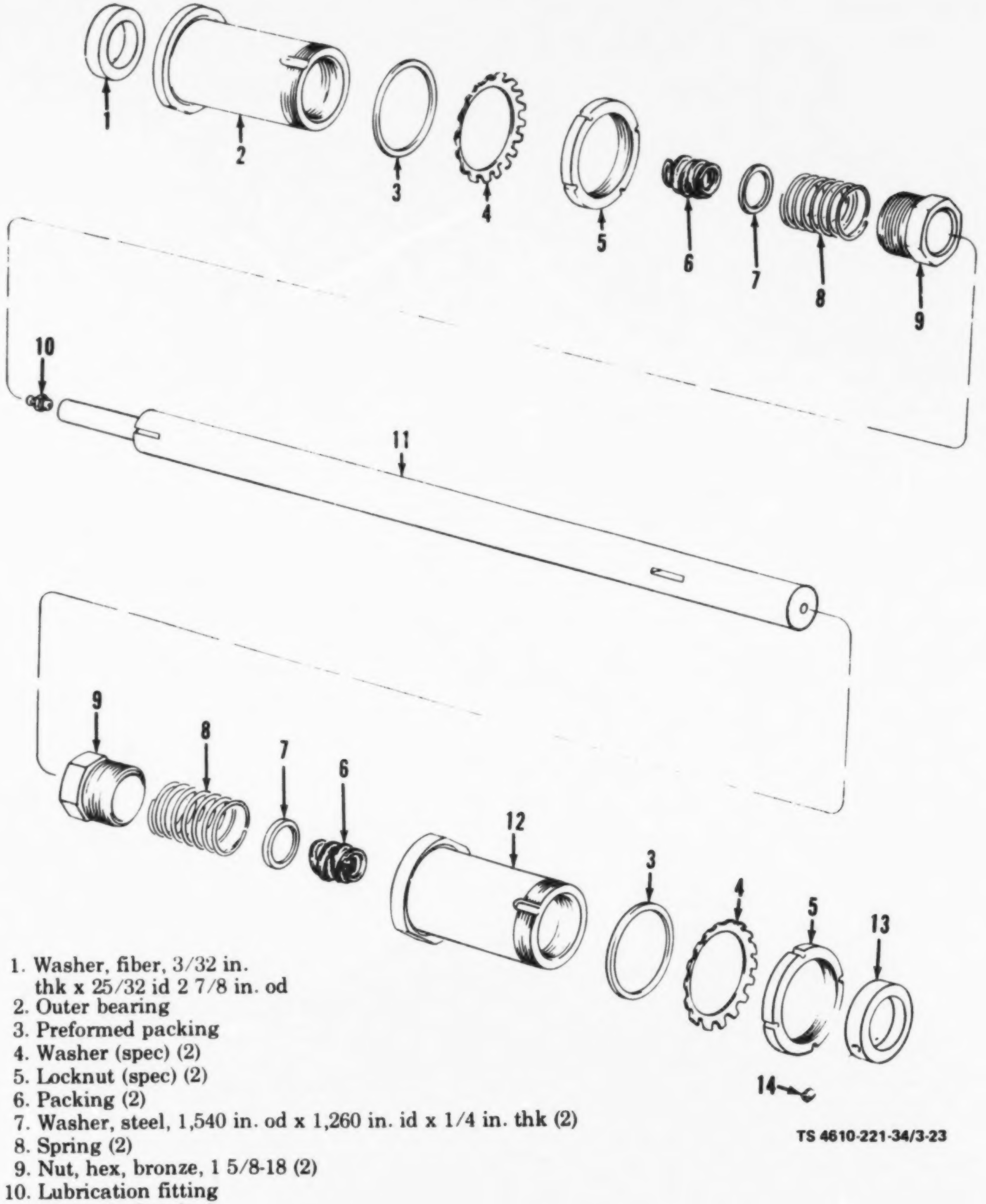
(6) Adjust tension on the packing by tightening or loosening the nuts (9) until a slight drag is felt while turning the slurry feeder shaft by hand.



TS 4610-221-34/3-22

1. Cup (4)
2. Plow (8)
3. Arm (4)
4. Nut, hex, stainless steel, 3/8-16 (16)
5. Washer, lock, stainless steel, 3/8 in. (20)
6. Screw, cap, stainless steel, 3/8-16 x 7/8 in. (16)
7. Filler (4)
8. Lockwasher, 1/4 in. (8)
9. Screw, cap, stainless steel, 1/4-20 x 5/8 in. (8)
10. Cup cover (4)
11. Screen (4)
12. Orifice plug (4)
13. Screw, cap, stainless steel, 3/8-16 x 1 1/2 in. (8)
14. Screw, cap, stainless steel, 3/8-16 x 1 3/4 in. (4)
15. Screw, cap, stainless steel, 3/8-16 x 2 1/2 in. (8)

Figure 3-22. Arm Assemblies, Exploded View


1
2
3
4
5
6
7
8
9
10
11
9
8
7
6
12
3
4
5
13
14
TS 4610-221-34/3-23

1. Washer, fiber, 3/32 in.
   thk x 25/32 id 2 7/8 in. od
2. Outer bearing
3. Preformed packing
4. Washer (spec) (2)
5. Locknut (spec) (2)
6. Packing (2)
7. Washer, steel, 1,540 in. od x 1,260 in. id x 1/4 in. thk (2)
8. Spring (2)
9. Nut, hex, bronze, 1 5/8-18 (2)
10. Lubrication fitting
11. Slurry feeder shaft
12. Inner bearing
13. Collar
14. Setscrew, 1/4-20 x 1/4 in.

Figure 3-23. Slurry Feeder Shaft and Bearings, Exploded View

CAUTION

Do not tighten the nuts (9) enough to bind the packing on the shaft as this will cause the shaft and bearing to heat and damage the packing.

(7) Position the plow (2, fig. 3-22) on one side of the arm (3) with the filler (7) on the other side and secure by installing two nuts (4), lockwashers (5), and capscrews (13).

(8) Position the plow (2) on the other extension of the arm (3) and secure by installing two nuts (4), lockwashers (5), and capscrews (14).

(9) Position a cup cover (10) to the filler (7) and secure by installing four lockwashers (5) and capscrews (6).

(10) Install an orifice plug (12) in the cup cover (10).

(11) Install the screen (11) in the cup (1).

(12) Install the cup (1) on the cup cover (10) and secure with the two lockwashers (8) and capscrews (9).

(13) Assemble the other three arms in a similar manner to that described above.

(14) Install two arm assemblies (2, fig. 3-21) on the slurry feeder shaft (10) from inside one compartment of the slurry feeder housing.

(15) Position the arm assemblies opposite each other and clamp them to the slurry feeder shaft with four nuts, lockwashers, and capscrews (3).

(16) Install the remaining two arm assemblies inside the other compartment of the slurry feeder housing and clamp them to the slurry feeder shaft in a similar manner.

(17) Position the cover plate (4, fig. 3-20) on the top of the slurry feeder housing (1) and secure with 10 lockwashers (2) and screws (3).

(18) From inside the slurry feeder housing (1), insert the cover assembly (22) through the hole in the housing and position the quadrant (29) on the shaft of the cover assembly outside the housing. Align the quadrant on the shaft of the cover assembly so that when the quadrant is at its highest position the cover assembly covers the funnel of the slurry feeder housing. Secure with a setscrew (28).

(19) Install the stud (26) in the side of the slurry feeder tank and secure with a nut (30).

(20) Intall the washer (5) and handwheel (27) on the stud (26) and clamp quadrant (29).

(21) Position the quadrant indicator (23) to the side of the slurry feeder housing (1) and secure with the two drive screws (24).

(22) Assemble the other quadrant indicator (23), quadrant (29), cover assembly (22), stud (26), and handwheel (27) in a similar manner to that described above.

(23) Install window (21), window gasket (20), and window frame (18) over the window opening in the front of the slurry feeder housing (1) and secure with 16 capscrews (19), lockwashers (32), and nuts (31).

(24) Install the other window in a similar manner.

(25) Install the door support rod (15) in the slurry feeder housing (1) and retain in place with two cotter pins (16).

(26) Insert a knob (9) through the top of the charging door (8). Position two washers (10), a latch (11), washer (12), and lockwasher (13) on the other end of the knob and secure with a screw (14).

(27) Install the other latch (11), knob (9), and washers (10) in a similar manner.

(28) Install the charging door (8) on the front of the slurry feeder housing (1) and secure with the two shoulder screws (7), lockwashers (6), and nuts (5).

f. Installation.

(1) Intall the slurry feeder assembly (1, fig. 3-19) on the slurry feeder frame (5) and secure with four capscrews (4), lockwashers (2), and nuts (3).

(2) Position the diatomite dilution tank (16, fig. 3-18) on the slurry feeder (4) and secure with the two nuts, lockwashers, and capscrews (18).

(3) Connect the plastic tube (14) to the bottom of the diatomite dilution tank (16) and secure with the hose clamp (15).

(4) Connect the plastic tube (11) to the diatomite dilution tank and secure with the hose clamp (12).

(5) Install the ejector (5, fg. 3-17) on the right side of the slurry feeder assembly (7).

(6) Connect the loose end of the copper tube (4) to the ejector (5) and tighten the tube nut (3) on that end to secure.

(7) Connect the plastic tube (8) to the ejector (5) and tighten the pipe bushing (6) to secure.

(8) For ETC Model S1500 only install the slip clutch assembly on the slurry feeder agitator shaft and fasten setscrew (9, fig. 3-16).

(9) Install the lubrication fitting (3, fig. 3-14) in the slurry feeder agitator shaft (2).

(10) Install the fiber washer (1, fig. 3-15) and the clutch housing (5, fig. 3-14) with attached sprocket (7) on the slurry feeder agitator shaft (2).

(11) Install the machine key (7, fig. 3-15) in the slurry feeder agitator shaft (2, fig. 3-14). Install the disk and hub portion of the slip clutch assembly (8) on the slurry feeder agitator shaft, aligning it on the machine key.

(12) Install the collar (1) on the slurry feeder agitator shaft (2) and secure with the setscrew (4).

(13) To adjust the slip clutch on the METPRO Model 1500-2600A pull the loop end of the lockwire (6, fig. 3-14) out of the hole in the adjusting nut (10) and place a block under it to keep it out.

(14) Turn the adjusting nut clockwise to increase torque and counterclockwise to decrease torque. Gradually turn the adjusting nut until a torque of 25 ft-lb (3.45 m-kg) is obtained.

(15) After the clutch has been adjusted, make sure the adjusting nut (10) is set so the loop end of the lockwire (6) extends through a hole and into a tooth space in the drive hub (9).

(16) To adjust the slip clutch on the ETC Model S1500 turn the adjusting nut clockwise to increase torque and counterclockwise to decrease torque. Turn the adjusting nut until a torque of 25 ft-lb (3.45 m-kg) is obtained.

(17) Install the drive chain (1, fig. 3-13) and secure the two loose ends together with the master link.

(18) Move the chain tightener assembly (2) toward the drive chain (1), meshing the teeth of the sprocket with the drive chain, until all of the slack is out of the drive chain. Tighten the nut (7) to secure the chain tightener assembly.

(19) Position the chain guard (2, fig. 3-12) on the slurry feeder assembly (5) and slurry feeder frame (4) and secure with the four capscrews (1), lockwashers (3), and two nuts.

(20) Install the drain and control valves and connect the filtered and raw water piping.

3-9. Chemical Solution Feeder Assembly.

a. General. The chemical solution feeder assembly consists of two diaphragm pumps operated by one electric motor through reduction gears which transmit the power to reciprocating mechanisms and priming levers. Each pump operates independently of the other. The gear reduction mechanism reduces the speed so the pumps operate approximately 12 strokes per minute. The gear reduction mechanism and motor are encased in a cast housing and operate in oil.

b. Removal of Assembled Feeder.

(1) Disconnect the electrical cable assembly from the right side of the chemical solution feeder assembly (8, fig. 3-24).

(2) Loosen the four hose clamps (5) and disconnect the plastic tubes (4) from the chemical solution feeder assembly.

(3) Remove the four bolts (9) and remove the chemical solution feeder assembly (8) from the slurry feeder frame (10).

(4) Disconnect the electrical cable from the terminal board in the twist lock receptacle box (7, fig. 3-25) and withdraw the cable from the receptacle.

(5) Remove the drainplug (33, fig. 3-26) and drain the oil from the chemical solution feeder into a suitable container.

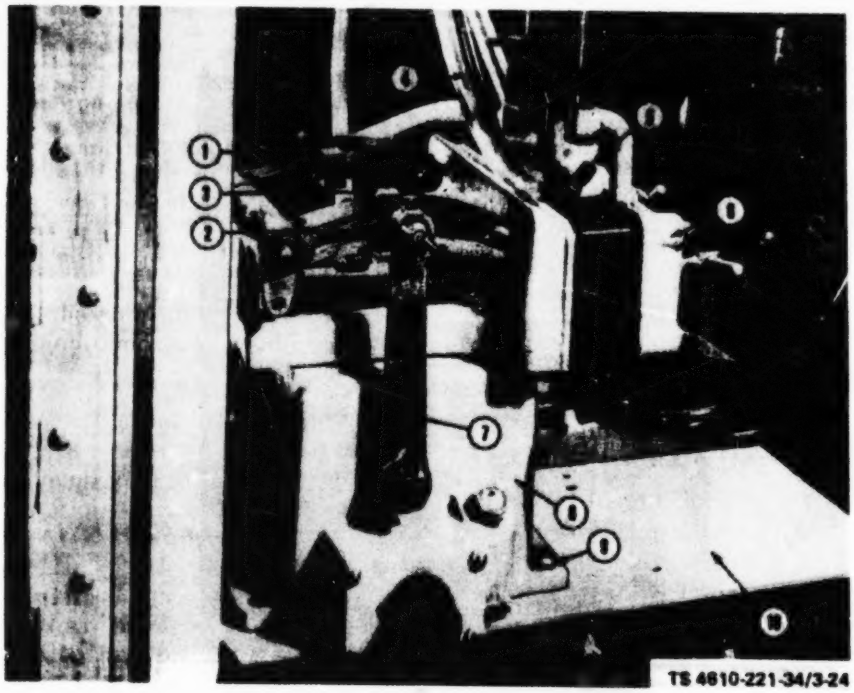
(6) Loosen the body clamping screw (15).

(7) Unscrew the screw and pin assembly (24, 25). Remove the four nuts (26) and washers (27) that hold the bell (23) to the pump (10).

(8) Remove and separate the bell (23), plate (22), yoke (21), pump (10), diaphragm (9) and plate (8) from the feeder (34).

(9) Remove the intake valve bodies (14), gaskets (11), pump poppet valves (13) and valve seats (12) from the pump (10).

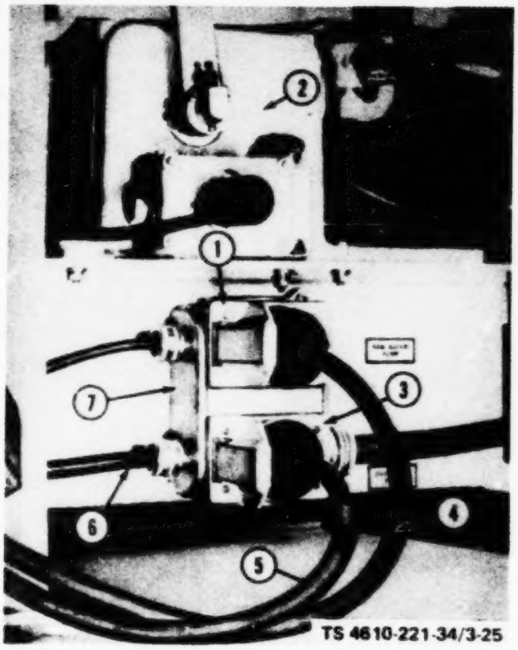
(10) Remove the other pump and attached parts in a similar manner.



TS 4610-221-34/3-24

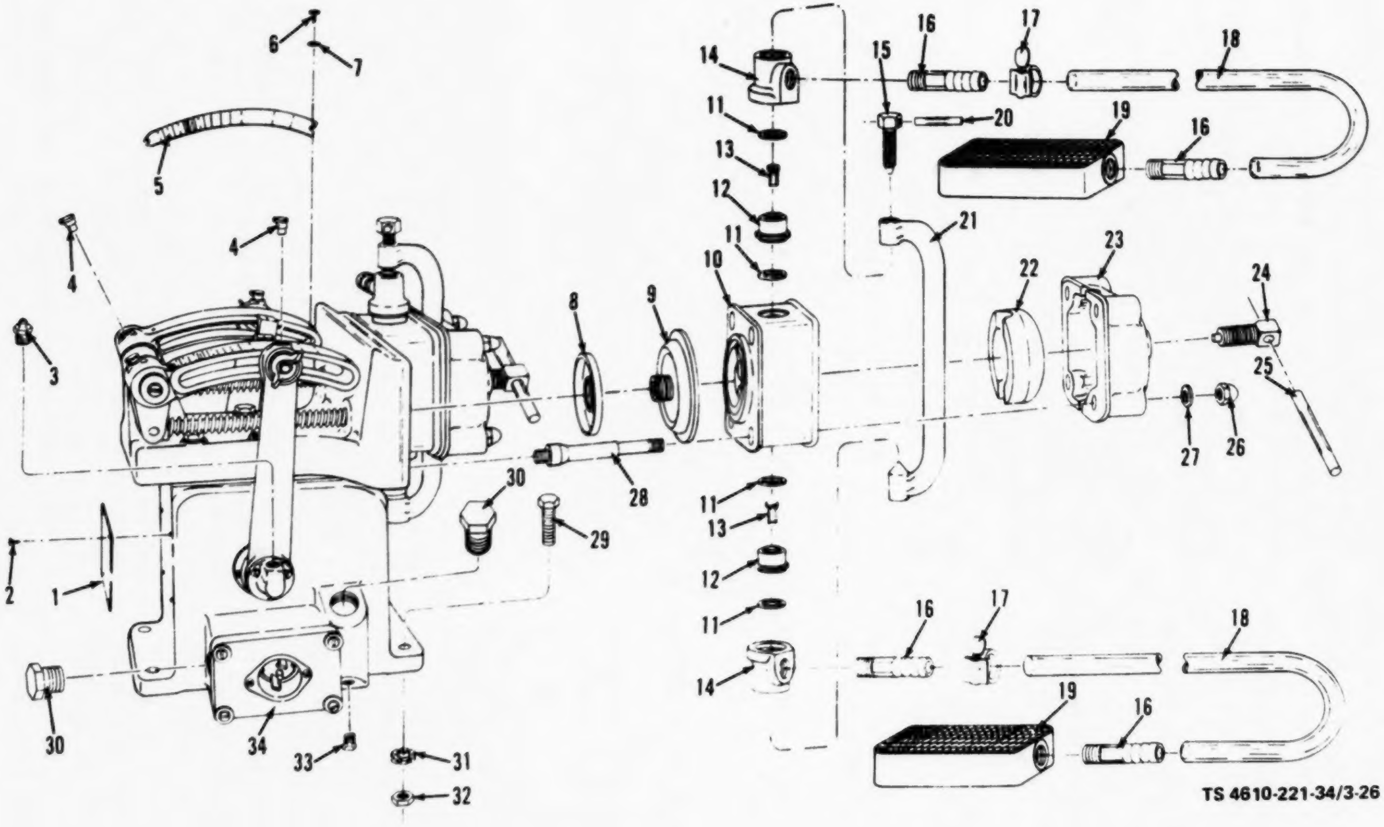
1. Ferric chloride feed variator (FEI-7)
2. Wingnut (2)
3. Calcium hypochlorite feed variator (FEI-8)
4. Plastic tube (4)
5. Hose clamp (4)
6. Pump
7. Driving arm (2)
8. Chemical solution feeder assembly
9. Bolt, machine, 1/4-20 x 1 1/4 inch (4)
10. Slurry feeder frame

Figure 3-24. Chemical Solution Feeder Assembly, Removal



1. Twist lock receptacle connector (raw water pump)
2. Chemical solution feeder assembly
3. Twist lock receptacle connector (distribution pump)
4. Cable
5. Cable
6. Cable - slurry feeder motor
7. Receptacle box

Figure 3-25. Twist Lock Receptacle Connectors


1
2
3
4
4
5
6
7
8
9
10
11
11
11
11
12
12
13
13
14
14
15
16
16
16
16
17
17
18
18
19
19
20
21
22
23
24
25
26
27
28
29
30
30
31
32
33
34
TS 4610-221-34/3-26

1. Plate
2. Screw
3. Fitting
4. Cup
5. Plate
6. Screw
7. Washer
8. Plate
9. Diaphragm
10. Pump
11. Gasket
12. Seat
13. Valve
14. Valve body
15. Screw
16. Nipple
17. Clamp
18. Hose
19. Strainer
20. Pin
21. Yoke
22. Plate
23. Bell
24. Screw
25. Pin
26. Nut
27. Washer
28. Stud
29. Screw
30. Plug
31. Washer
32. Nut
33. Plug
34. Feeder

Figure 3-26. Chemical Solution Feeder Assembly, Exploded View

c. Removal and Disassembly of Drive Arms and Pipe Plugs.

(1) Remove the pipe plugs (13 and 55, fig. 3-27) from the solution feeder housing (12) and drain the oil.

(2) Remove the wingnuts (1, fig. 3-28) from the feed pointers (4) and remove washers (2).

(3) Remove the pointers (4) from the levers (15, fig. 3-27) and the lever arms (40 and 36, fig. 3-28).

(4) Remove the six screws (20, fig. 3-27) securing the bearing caps (19) to the two levers (15).

(5) Remove the grease fittings (18) from the bearing caps and retain them for new bearing caps.

(6) Remove the two nuts (38) and washers (37) securing the levers (15) to the main shaft (43).

(7) Remove the levers (15) from the shaft (43) and press bearings (17) and bushing (3, fig. 3-28) from the driving arms.

(8) Remove the screws (16, fig. 3-27) securing the seal covers (54) and remove the covers and screws from the feeder.

d. Removal and Disassembly of Lever Arms, Pushrods, and Top Housing.

(1) Remove the two screws (32, fig. 3-28) and washers (31) securing the lever arms (41 and 37) to the lever arm shaft (8).

(2) Lift up on the lever arms (41 and 37) until the pushrods (9) are free from the chemical solution top housing.

(3) Remove lever arms (41 and 37) with pushrods (9) as an assembly from the lever arm shaft (8).

(4) Remove the screws (26) and washers (27) securing the scales (5) to the lever arms (41 and 37) for installation on new lever arms.

(5) Slide the springs (10) from the pushrods (9) and unscrew the pushrods from pivot blocks (34).

(6) Use a small drift punch and remove the pins (35) securing the roll pins (33) to the lever arms (41 and 37).

(7) Slide the roll pins (33) from pivot blocks (34) and the lever arms.

(8) Remove the pin (39) and lever arm shaft (8) from the solution feeder top housing (38).

(9) Remove the four screws (29) and washers (30) securing the solution feeder top housing (38) to the gear unit housing (12, fig. 3-27) and remove the top housing.

e. Removal and Disassembly of Junction Box Cover and Receptacle.

(1) Remove the four screws (23, fig. 3-27) and washers (22) securing the junction box cover (21) to the gear unit housing (12).

(2) Pull the cover (21) away from the housing (12) and remove the terminals (26) from the housing.

(3) Remove the three packings (27) from the terminals (26).

(4) Remove the three screws (16) securing the wires to the feed-thru terminals (26) and tag the wires to facilitate reassembly.

(5) Remove the two screws (24) securing the receptacle connector (25) to the junction box cover (21).

(6) Pull the receptacle connector from the junction box cover with wires attached and disconnect the wires from the connector. Tag wires to facilitate reassembly.

f. Removal of Gear Unit.

(1) Remove the eight screws (2, fig. 3-27) from the side cover (39) and remove the side cover with gear unit attached.

(2) Remove gasket (11) from the gear unit housing.

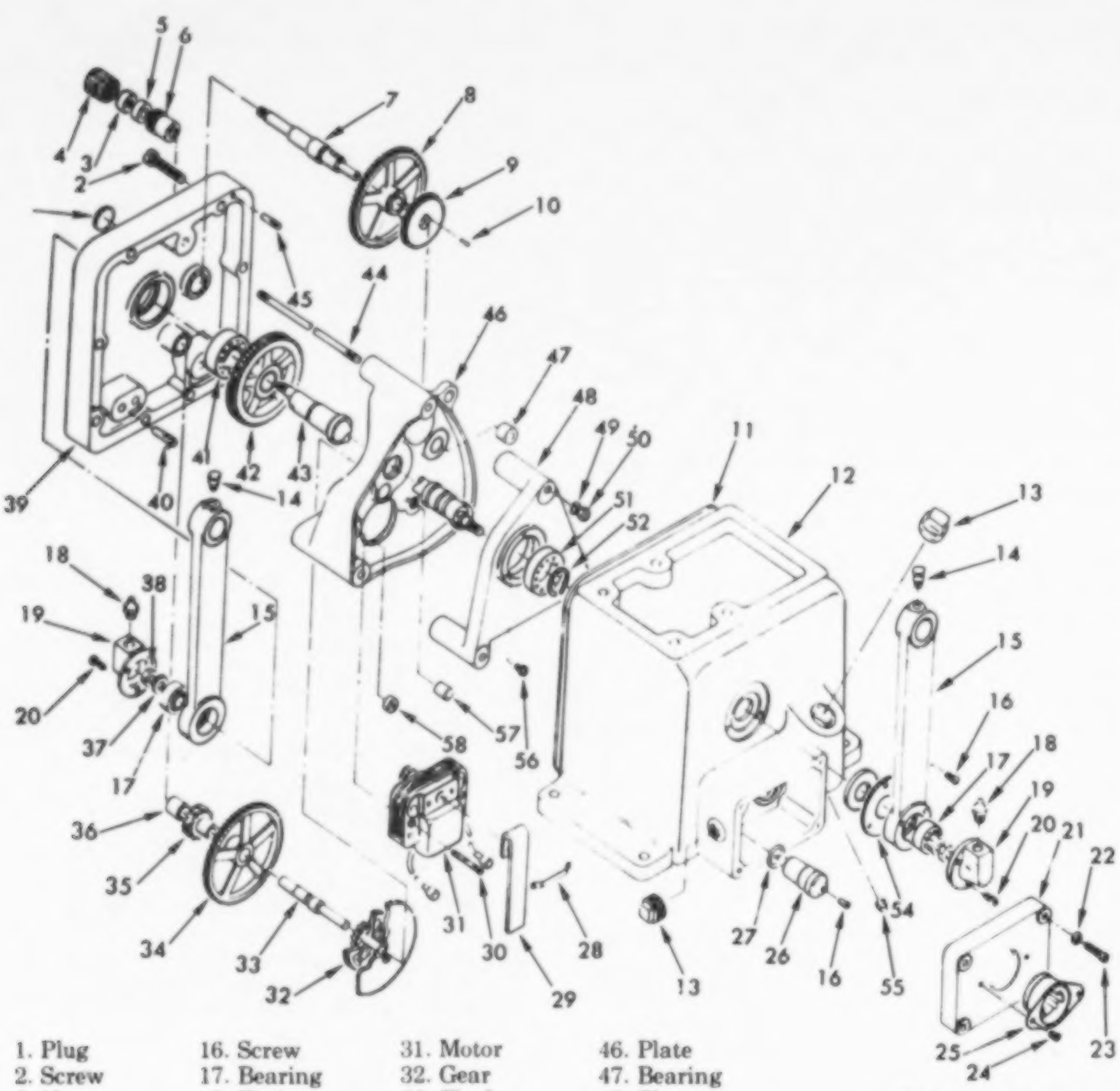
(3) Remove the three screws (16) securing seal cover (54) and felt seal (53) to the gear unit housing.

g. Disassembly of Gear Unit.

(1) Remove the three nuts (50, fig. 3-27) and washers (49) from the studs (44) securing the support casting plate (46) and bearing plate (48) to the side cover (39).

(2) Remove the bearing cap (4), gear shaft nut (3), spacer (5), and shaft bearing (6) from the change gear and shaft assembly (7, 8, 9, and 10).

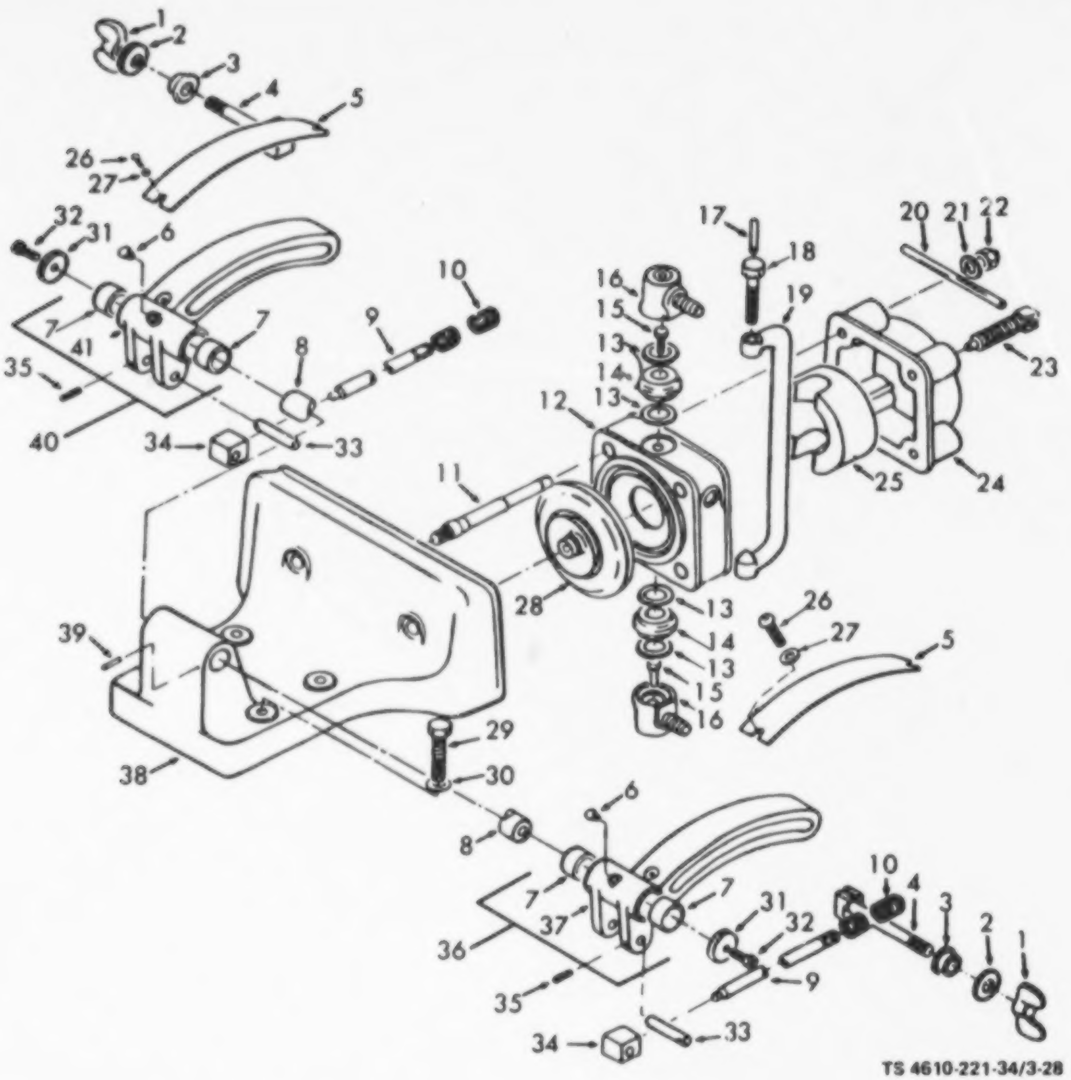
(3) Remove the bearing plate (48) from the main shaft (45).


1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
54
55
56
57
58

1. Plug
2. Screw
3. Nut
4. Cap
5. Spacer
6. Bearing
7. Gearshaft
8. Gear
9. Gear
10. Pin
1. Gasket
2. Housing
13. Plug
14. Cup
5. Lever
16. Screw
17. Bearing
18. Fitting
19. Cap
20. Screw
21. Screw
22. Washer
23. Screw
24. Screw
25. Connector
26. Terminal
27. Packing
28. Clip
29. Wick
30. Screw
31. Motor
32. Gear
33. Shaft
34. Gear
35. Gear
36. Bearing
37. Washer
38. Nut
39. Cover
40. Pin
41. Bearing
42. Gear
43. Shaft
44. Stud
45. Pin
46. Plate
47. Bearing
48. Plate
49. Washer
50. Nut
51. Bearing
52. Ring
53. Seal
54. Cover
55. Plug
56. Screw
57. Bearing
58. Spacer

TS 4610-221-34/3-27

Figure 3-27. Chemical Solution Feeder Gearbox, Exploded View


1
2
3
4
5
26
27
32
31
6
7
41
7
35
40
8
9
10
34
33
17
18
19
20
21
22
16
15
13
14
13
12
23
25
24
11
28
13
14
13
15
16
26
27
5
39
29
30
38
6
8
7
37
7
36
31
32
10
4
3
2
1
35
9
34
33

TS 4610-221-34/3-28

1. Nut
2. Washer
3. Bushing
4. Pointer
5. Scale
6. Cup
7. Bearing
8. Shaft
9. Pushrod
10. Spring
11. Stud
12. Pump
13. Gasket
14. Seat
15. Valve
16. Valve
17. Pin
18. Screw
19. Yoke
20. Pin
21. Washer
22. Nut
23. Screw
24. Endbell
25. Plate
26. Screw
27. Washer
28. Diaphragm
29. Screw
30. Washer
31. Washer
32. Screw
33. Pin
34. Block
35. Pin
36. Rocker
37. Lever arm
38. Housing
39. Pin
40. Rocker
41. Lever arm

Figure 3-28. Chemical Solution Feeder, Exploded View

(4) Remove the two screws (30) and motor spacers (58) from the support casting plate (46) and remove the motor (31).

(5) Remove the support casting plate (46) from shaft and gear assemblies (7, 8, 9, 10, and 33, 34, 35).

(6) Remove main shaft and gear assembly (42 and 43) from the side cover (39) and remove bearing (51) from shaft.

(7) Slide the gear assembly (32) from the shaft (33) of the idler gear (34). Remove gear (35) and needle bearing (36) from the side cover, and needle bearing (47) from the support casting plate (46).

(8) Remove the change gear and shaft assembly (7, 8, 9, 10) from the side cover (39) and the bushing bearing (57) from the support casting, if it is to be replaced.

(9) Remove the plug (1) and grooved pins (40 and 45) from the side cover.

(10) Remove the three screws (56) securing the bearing (51) to the bearing plate (48).

(11) Remove snapring (52) and bearing (51) from the bearing plate.

h. Cleaning, Inspection, and Repair.

WARNING

Drycleaning solvent, P-D-680, used to clean parts is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Do not use near open flame or excessive heat. Flash point of solvent is 100 degrees F - 138 degrees F (38 degrees C - 59 degrees C).

(1) Cleaning.

(a) Clean all parts with cleaning solvent (item 1, App. C).

(b) Lubricate the bearings.

(2) Inspection.

(a) Inspect top housing cover, gear unit housing, and the lever and drive arms for cracks.

(b) Inspect the gears and shafts for worn, chipped or broken teeth.

(c) Inspect pushrods for misalignment and worn, or damaged threads.

(d) Inspect the electrical components and spacers for deterioration and damage.

(3) Repair. Replace all unserviceable parts that cannot be repaired.

i. Reassembly of Gear Unit.

(1) Press bearing (51, fig. 3-27) into the bearing plate (48) and secure it with snapring (52) and screws (56).

(2) Install grooved pins (40 and 45) and plug (1) in the side cover (39).

(3) Install the needle bearing (36) in the side cover and needle bearing (47) and bushing bearing (57) in the support casting.

(4) Screw the three studs (44) in the side cover (39) and tighten them securely.

(5) Slide the gear assembly (32) on the shaft (33) of the idler gear (34). Position gear (35) and shaft in the bearing, in the side cover (39).

(6) Install a bearing (51) on the main shaft and gear assembly (42, 43), on the end next to the gear and position the shaft in the side cover (39).

(7) Position the change gear and shaft assembly (7, 8, 9, 10) in the side cover (39) and slide shaft bearing (6) over the shaft of the change gear and install it in the side cover (39).

(8) Position the support casting plate (46) on the studs (44) and over main shaft (43) and insert shafts of change gear (8) and idler gear (34) in their bearings.

(9) Connect the motor leads if they had been disconnected.

(10) Position the motor (31) and pinion gear to the support casting plate (46) with pinion meshed and motor spacers (58) in place; secure it with two screws (30).

(11) Position the bearing plate (48) on the studs (44) and install main shaft (43) in bearing (51).

(12) Place the three washers (49) and nuts (50) on the studs and tighten the nuts securely.

(13) Secure the change gear and shaft assembly (7, 8, 9, 10) with spacer (5), gear shaft nut (3), and bearing cap (4).

j. Installation of Gear Unit.

(1) Position the gasket (11, fig. 3-27) on the gear unit housing (12).

(2) Position the side cover (39), with gear unit, in the gear unit housing (12) with the grooved pins in the holes of the gear unit housing.

(3) Secure the side cover (39) with the eight screws (2) to the gear unit housing (12).

(4) Position the felt seal (53) and seal cover (54) on the gear unit housing (12) and secure it with four screws (16).

k. Reassembly and Installation of Junction Box Cover and Receptacle.

(1) Place the three packings (27, fig. 3-27) on the terminals (26) and press the terminals in the gear unit housing (12).

(2) Position the wires on the terminal plugs as tagged during disassembly and secure them to the terminals with screws (16).

(3) Insert the three wires through the junction box cover (21) and secure the junction box cover to the gear unit housing (12) with the four screws (23) and washers (22).

(4) Connect the wires to the receptacle connector (25) and secure the connector to the junction box cover with two screws (24).

l. Reassembly and Installation of Lever Arms, Pushrods, and Top Housing.

(1) Position the chemical solution feeder top housing (38, fig. 3-28) on the gear unit housing (12, fig. 3-27) with screw holes aligned and secure it with the four screws (29) and washers (30).

(2) Position the lever arm shaft (8, fig. 3-28) in the top housing (38) and secure it with the pin (39).

(3) Screw the pushrods (9) in the pushrod pivot blocks (34) and slide the pushrod springs (10) over the pushrods.

(4) Position the pivot blocks (34) in the lever arms (41 and 37) and insert a roll pin through each pivot block and arm with the pin holes aligned.

(5) Secure the roll pins (33) to the lever arms with pins (35).

(6) Position the scales (5) on the lever arms (41 and 37) with screw holes aligned with those of the lever arms.

(7) Secure the scales (5) to the lever arms with screws (26) and washers (27).

(8) Install the lever arm and pushrod assemblies on the lever arm shaft (8) and secure them to the lever arm shaft with screws (32) and washers (31).

m. Reassembly and Installation of Drive Arms and Pipe Plugs.

(1) Position and seal cover (54, fig. 3-27) on the chemical solution feeder housing (12), over the main shaft assembly (43) and secure it with screws (16).

(2) Press the bearings (17) in the driving levers (15) and install the levers on the main shaft assembly (43).

(3) Install a bushing (3, fig. 3-28) from the inner side in each arm assembly (15, fig. 3-27).

(4) Secure the driving arm (15) to the main shaft assembly with nuts (38) and washers (37).

(5) Position the bearing caps (19) on the driving levers and secure them to the levers with screws (20).

(6) Install the grease fittings (18) in the bearing caps (19).

(7) Insert the feed indicator pointer (4, fig. 3-28) screws through the lever arms (41 and 37) and driving levers (15, fig. 3-27) and install the washers (2, fig. 3-28) and wingnuts (1).

(8) Install the pipe plugs (13 and 55, fig. 3-27) in the chemical solution feeder housing (12).

n. Installation of Feeder Assembly.

(1) Install the intake valve bodies (14, fig. 3-26), gaskets (11), pump poppet valves (13) and valve seats (12) onto the pump (10). Secure with yoke (21) and screw (15).

(2) Install the diaphragm (9), plate (8), plate (22) and the bell (23) onto the feeder (34).

(3) Insert the four nuts (26) and washers (27) onto the bell (23) and tighten.

(4) Install and tighten the screw and pin assembly (24, 25).

(5) Tighten the body clamping screw (15).

(6) Assemble the other pump and its parts in a similar manner.

(7) Fill the feeder with oil by removing plug (30), installing the oil and inserting plug (30) again.

(8) Connect the electrical cable to the terminal board in the twist lock receptacle box.

(9) Position the chemical solution feeder assembly (8, fig. 3-24) on the slurry feeder frame (10) and secure with the four bolts (9).

(10) Connect the four plastic tubes (4) to the chemical solution feeder assembly and secure each tube with a hose clamp (5).

(11) Connect the cable assembly to the chemical solution feeder assembly.

3-10. Slurry Feeder Frame.

a. Removal.

(1) Remove the chemical solution feeder assembly (para 3-9).

(2) To remove the chemical solution tanks remove the nut (2, fig. 3-29) and washer (3) from the stud (9) and lift the clamp arm (4) from the covers (1).

(3) Remove the covers (1) from the tanks (5 and 6).

(4) Remove the two tanks from the slurry feeder frame.

(5) Remove the stud (9) from the slurry feeder frame.

(6) Remove the chain guard and drive chain (para 3-8).

(7) Remove the nut, lockwasher, bolts (7, fig. 3-13), and flat washers (8) and remove the chain tightener assembly (2) from the slurry feeder frame (6).

(8) Remove the three capscrews (9, fig. 3-30) and lockwashers (11) and remove the belt guard (10) from the slurry feeder frame (8).

(9) Loosen the four capscrews (6, fig. 3-31) and move the motor assembly (2) to the left.

(10) Remove the V-belt (1) from the motor pulley (3) and gear assembly pulley (7).

(11) Disconnect the cable (6, fig. 3-25) from the twist lock receptacle connector (1), located beneath the chemical solution feeder assembly (2).

(12) Remove the four capscrews (6, fig. 3-31), lockwashers (5), and nuts and remove the motor assembly (2) from the slurry feeder frame (4).

(13) Remove the four nuts (13, fig. 3-32), lockwashers (12), and capscrews (11) and remove the slurry feeder gear assembly (3) from the slurry feeder frame.

(14) Remove the slurry feeder and chemical solution feeder electrical cable from the receptacle box.

(15) Remove the screws (3, fig. 3-33) and lockwashers (2) that secure the receptacle box (1) to the slurry feeder frame (4).

(16) Disconnect the electrical wires from the two receptacles and remove the locknut inside the receptable box.

(17) Disconnect the electrical wires inside the control cabinet and remove the locknut from the cable inside the control cabinet.

(18) Remove the slurry feeder assembly (para 3-8).

(19) Remove the four capscrews (8, fig. 3-33), lockwashers (7), and washers (6) and remove the slurry feeder frame (4) from the van body (5).

b. Cleaning, Inspection, and Repair.

(1) Clean the slurry feeder frame with an approved cleaning solvent and dry thoroughly.

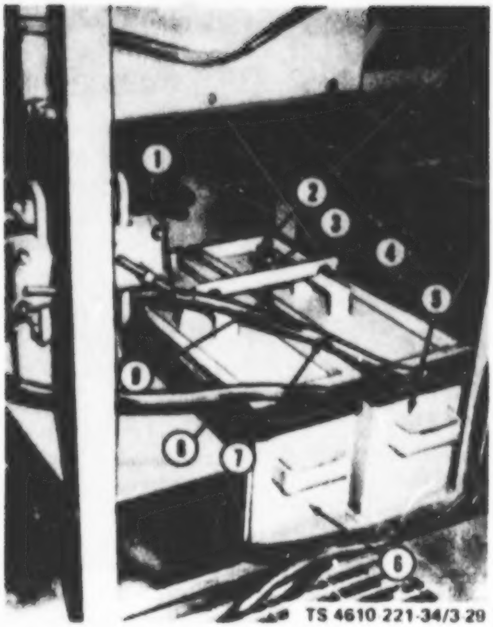
(2) Inspect the slurry feeder frame for damaged screw threads, distortion, and cracked or broken welds. Retap any damaged thread to an oversize and use a larger screw if it is practical, straighten minor distortion, and reweld cracked or broken welds. Replace the slurry feeder frame if damaged beyond repair.

c. Installation.

(1) Install the slurry feeder frame (4, fig. 3-33) inside the van body (5) and secure with the four washers (6), lockwashers (7), and capscrews (8).

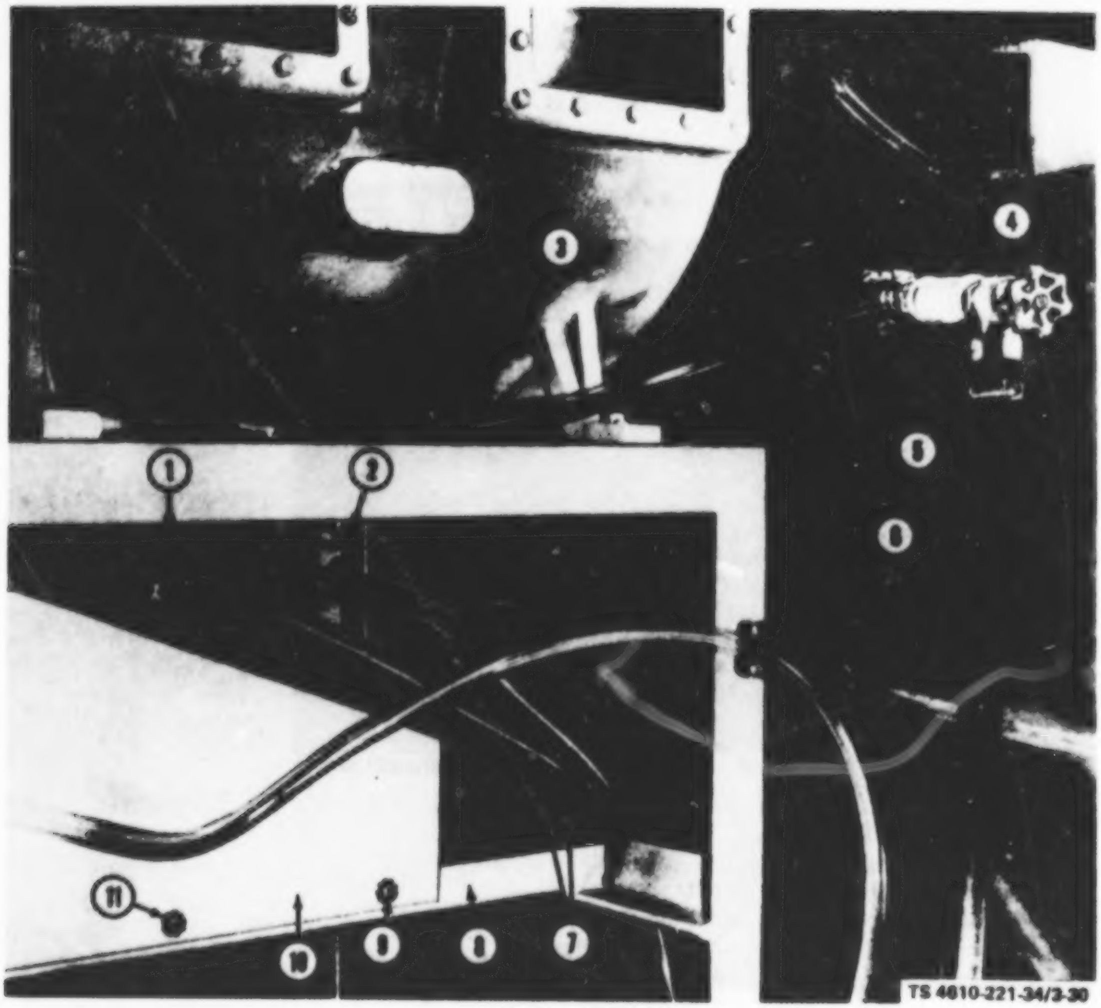
(2) Install the slurry feeder assembly (para 3-8).

(3) Insert the electrical cable into the receptacle box, install the locknut and connect the


1
2
3
4
5
9
8
7
6
TS 4610 221-34/3 29

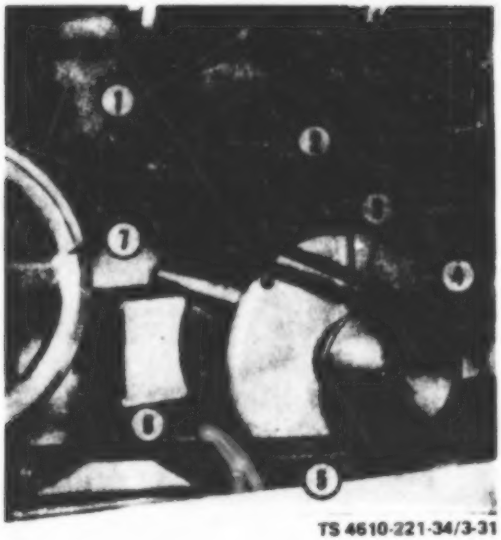
1. Cover (2)
2. Nut, plain, wing, 1/2-13
3. Washer, flat, 1/2 in.
4. Clamp arm
5. Ferric chloride solution tank
6. Calcium hypochlorite solution tank
7. Plastic tube
8. Plastic tube
9. Stud, 1/2-13 x 15 in.

Figure 3-29. Chemical Solution Tanks, Removal


1
2
3
4
5
6
7
8
9
10
11
TS 4610-221-34/3-30

1. Drain valve (DV-26)
2. Drain valve (DV-27)
3. Slurry feeder assembly
4. Control valve (CV-15)
5. Hose, 6 ft.
6. Erdlator tank
7. Tubing, 5 ft 6 in. (2)
8. Slurry feeder frame
9. Screw, cap, 1/4 - 20 x 3/4 in. (3)
10. Belt guard
11. Lockwasher, 1/4 in. (3)

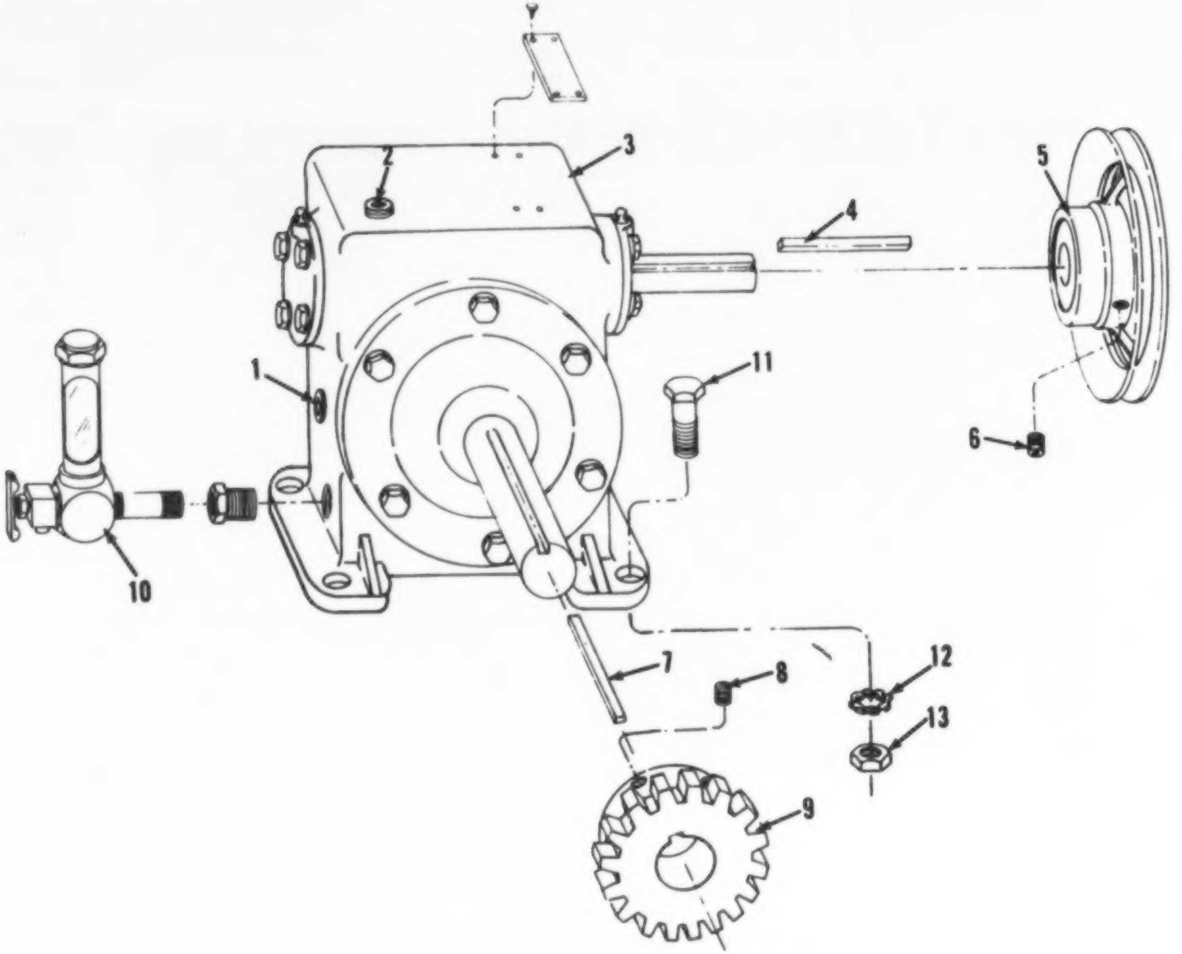
Figure 3-30. Belt Guard, Removal



TS 4610-221-34/3-31

1. V-belt
2. Motor assembly
3. Motor pulley
4. Slurry feeder frame
5. Lockwasher, 5/16 in. (4)
6. Screw, cap, 5/16-18 x 1 in. (4)
7. Gear assembly pulley

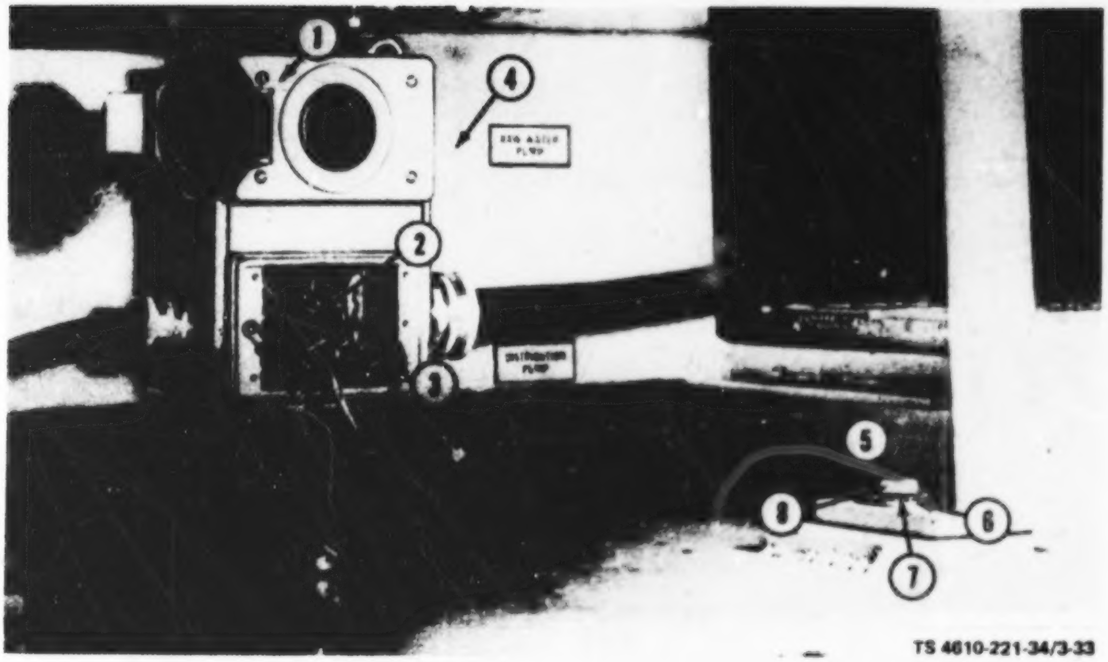
Figure 3-31. V-Belt, Removal



TS 4610-221-34/3-32

1. Oil level plug
2. Breather plug
3. Slurry feeder gear assembly
4. Key, machine, square, 3/16 x 1 in.
5. Pulley
6. Setscrew, 5/16-18 x 1/4 in.
7. Key, machine, square, 1/4 x 1 3/8 in.
8. Setscrew, 3/8 x 1/2 in. (2)
9. Sprocket
10. Level guage and draincock
11. Screw, cap 3/8-16 x 1 1/4 in. (4)
12. Lockwasher, 3/8 in. (4)
13. Nut, hex, 3/8-16 (4)

Figure 3-32. Slurry Feeder Gear Assembly, Exploded View



TS 4610-221-34/3-33

1. Receptacle box
2. Washer, lock, 1/4 in. (4)
3. Screw, pan hd, thd-forming, 1/4-20 in. (4)
4. Slurry feeder frame
5. Van body
6. Washer, flat, 1/2 in. (4)
7. Lockwasher, 1/2 in. (4)
8. Screw, cap, hex dr, 1/2-13 x 1 1/2 in. (4)

Figure 3-33. Receptacle Box, Removal

electrical wires to the receptacle.

(4) Insert the other end of the electrical cable into the control cabinet, install the locknut and connect the electrical wires inside the control cabinet.

(5) Position the receptacle (1, fig. 3-33) to the slurry feeder frame (4) and secure with four screws (3) and washers (2).

(6) Connect the solution feeder and slurry feeder electrical cables to the receptacle box.

(7) Install the slurry feeder gear assembly (4, fig. 3-13) on the slurry feeder frame (6) and secure with the four nuts (13, fig. 3-32), lockwashers (12), and capscrews (11).

(8) Position the motor assembly (2, fig. 3-31) on the slurry feeder frame (4) and loosely secure with four nuts, lockwashers (5), and capscrews (6).

(9) Connect the cable (6, fig. 3-25) into the receptacle box terminal strip, located beneath the chemical solution feeder assembly (2).

(10) Install the V-belt (1, fig. 3-31) on the motor pulley (3) and gear assembly pulley (7).

(11) Move the motor assembly (2) to the right, away from the gear assembly, until the V-belt can be depressed approximately one inch midway between the two pulleys. Tighten the four capscrews (6) to secure the motor assembly.

NOTE

Check the pulley alignment. The V-belt must run squarely in the grooves of the pulleys.

(12) Install the belt guard.

(13) Position the chain tightener assembly (2, fig. 3-13) against the drive chain (1).

(14) Install the drive chain and chain guard (para 3-8).

(15) Install the stud (9, fig. 3-29) in the slurry feeder frame.

(16) Position the two tanks (6 and 5) on either side of the stud.

(17) Install the two covers (1).

(18) Position the clamp arm (4) over the covers on the stud (9) and secure with the flat washer (3) and nut (2).

(19) Install the chemical solution feeder assembly (para 3-9).

3-11. Influent and Effluent Launders.

a. Removal.

(1) Remove the raw water pressure gage (3, fig. 3-34) and raw water piping from the aspirator manifold.

(2) Turn the aspirator (2) clockwise, unscrewing it from the raw water piping above the influent launder (1).

(3) Remove the other three aspirators in a similar manner.

(4) Turn the handwheel (9, fig. 3-35) counterclockwise to release the tension on the V-belt (5).

(5) Remove the V-belt from the pulley (6).

(6) Remove the four nuts (8, fig. 3-36), lockwashers (7), and capscrews (6) that secure the two bearing units (4) to the brackets (10).

(7) Remove the V-belt from the pulley (2, fig. 3-35), raise the erdlator drive shaft (20), and remove the V-belt (5) from the erdlator drive shaft.

(8) Remove the four screws (13, fig. 3-37) and remove the junction box cover (12) and gasket (11) from the motor assembly (7).

(9) Remove the three wire nuts (14) and separate the three electrical leads of the cable (1) from the motor electrical leads.

(10) Loosen the cable connector nut (2) and remove the cable (1), with attached cable connector nut, from the motor assembly.

(11) Remove the grommet (4), seal (3), and cable connector nut (2) from the cable.

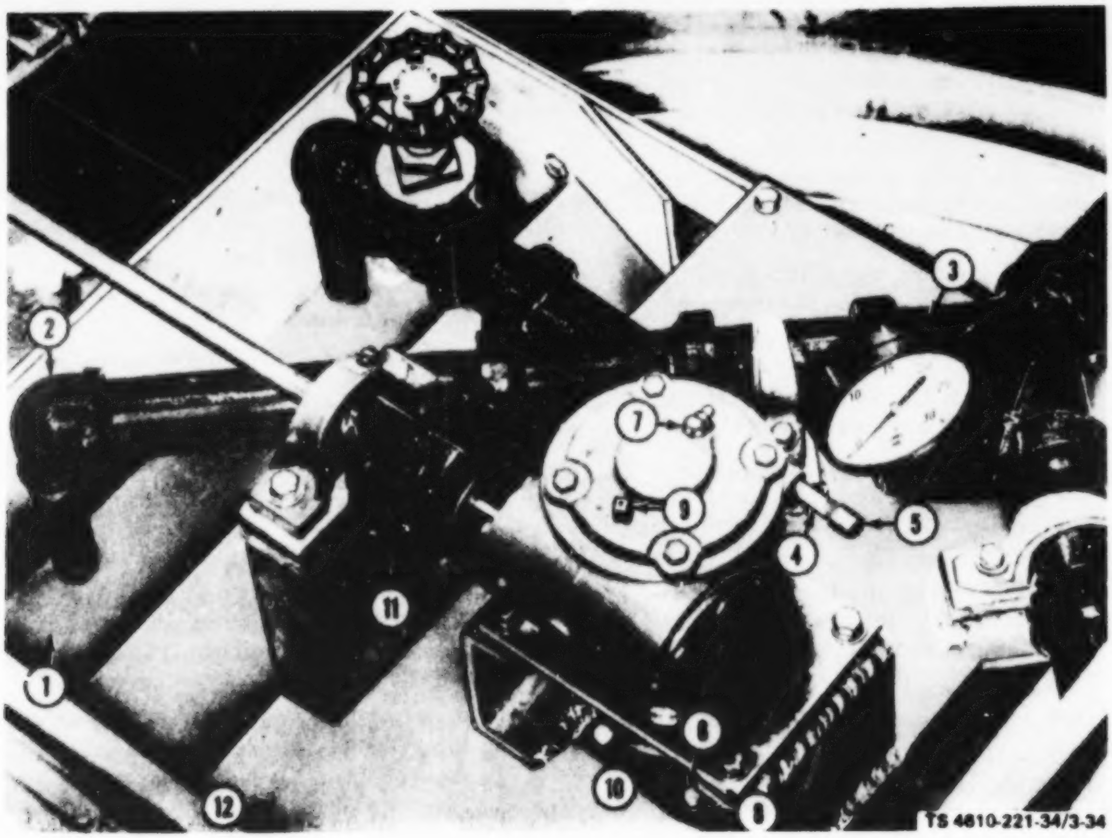
(12) Remove the cable connector (6) from the motor assembly (7).

(13) Disconnect the electrical cable in the control cabinet.

(14) Loosen the clamps that secure the cable to the rear bridge rail.l

(15) Remove the four nuts, lockwashers, capscrews (7, fig. 3-35), and eight flat washers (8) and remove the motor assembly (12) from the agitator motor base (11).

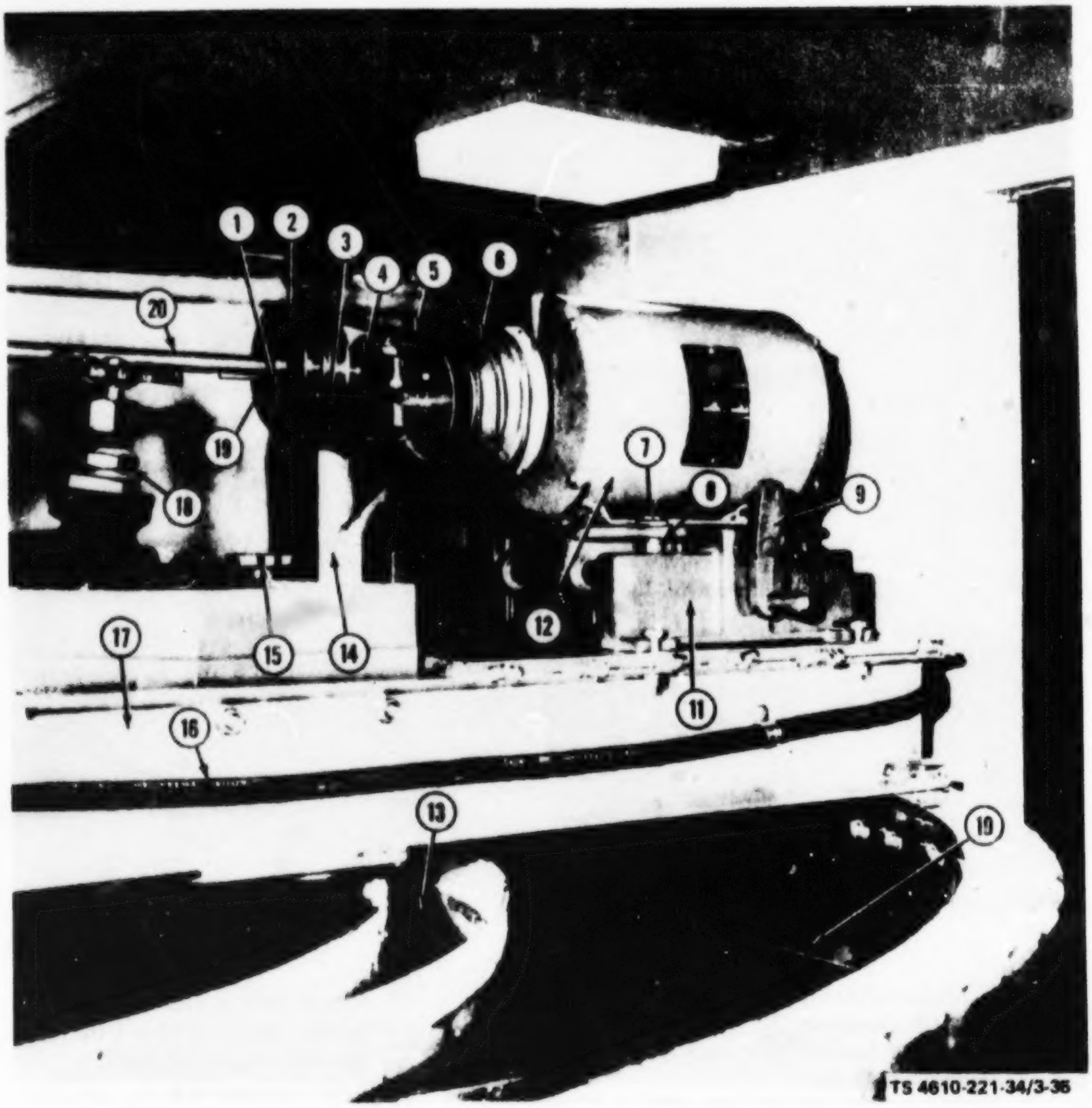
(16) Remove the screws (1, fig. 3-38) and washers (3, 4) and nuts (5) that secure the agita-



TS 4610-221-34/3-34

1. Influent launder (2)
2. Aspirator (4)
3. Raw water pressure gage (PI-1)
4. Drainplug
5. Cap
6. Screw, cap, 5/16-18 x 1 in. (4)
7. Lubrication fitting
8. Lockwasher, ET, 5/16 in. (4)
9. Fill plug
10. Agitator shaft bearing
11. Flexible coupling
12. Motor mount plate

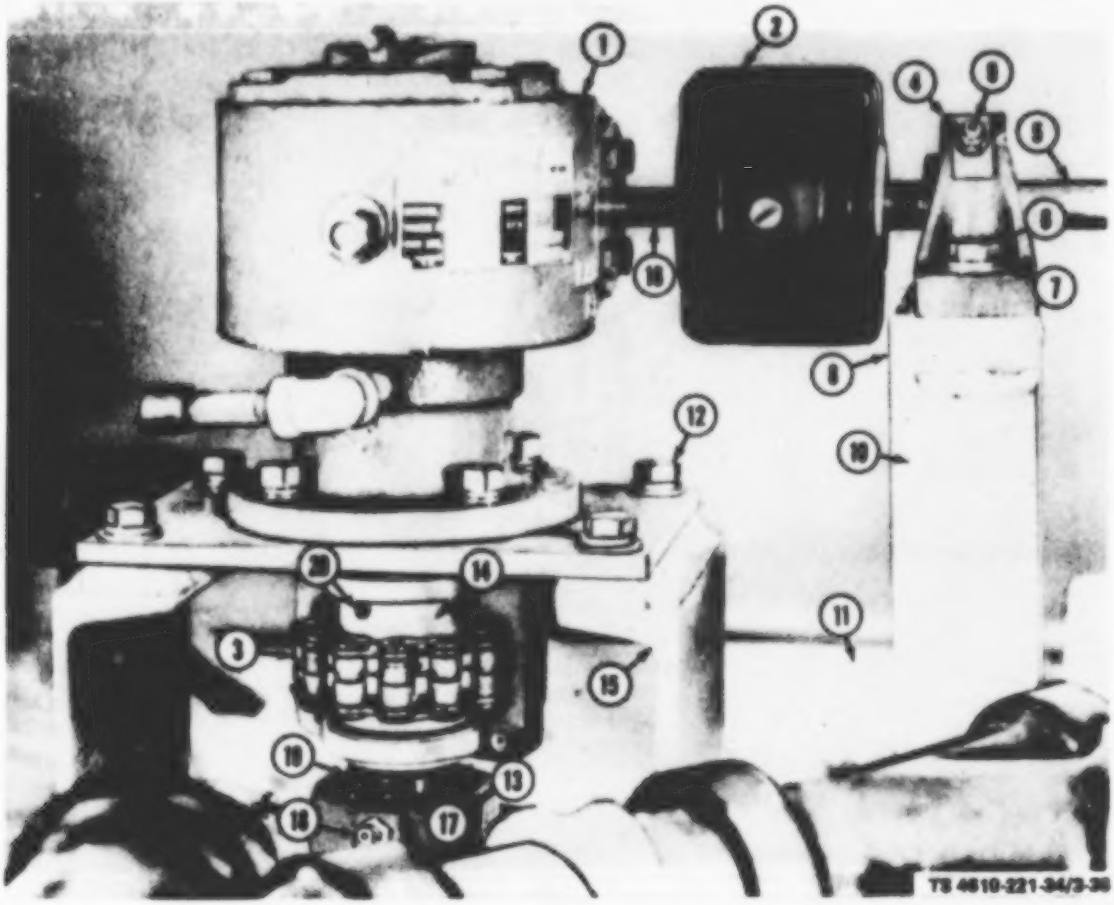
Figure 3-34. Raw Water Pressure Gage and Aspirator, Removal



TS 4610-221-34/3-35

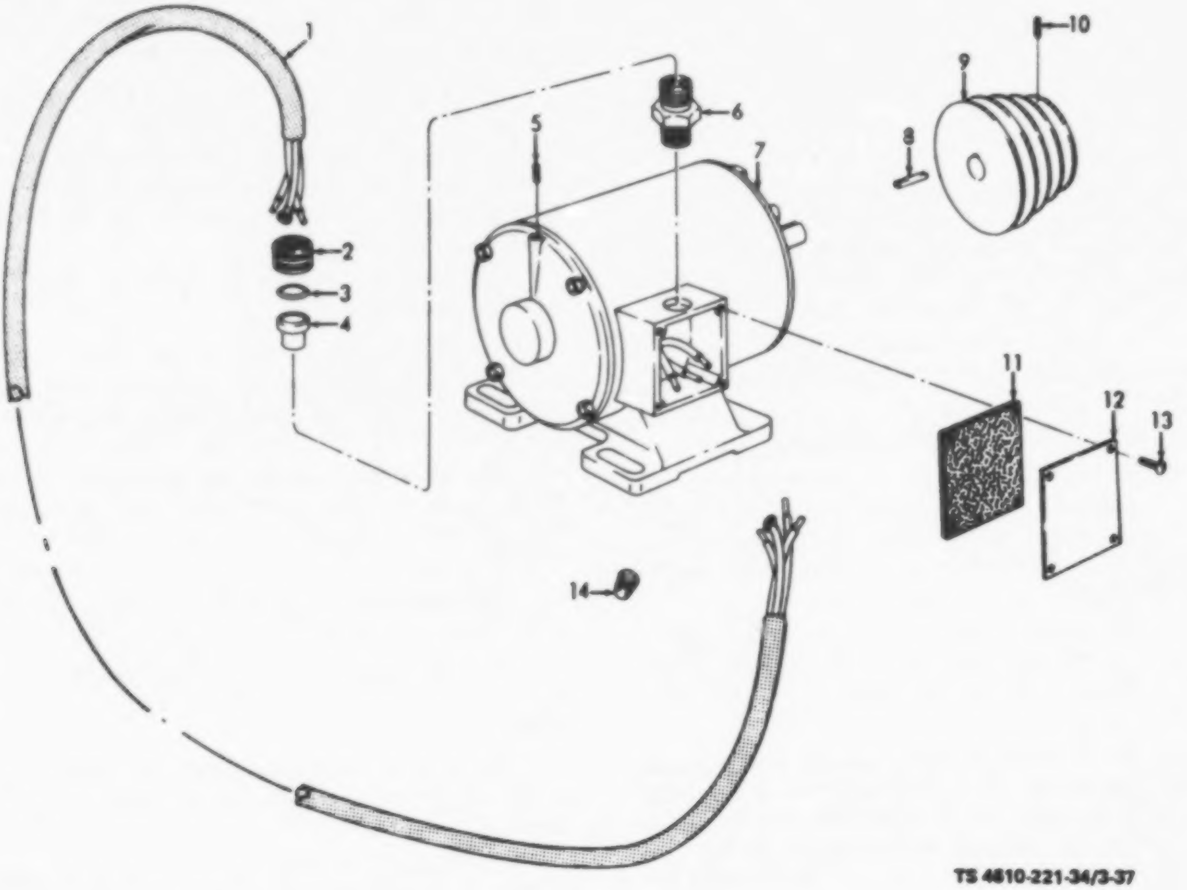
1. Setscrew, 1/4-20 x 3/8 in. (2)
2. Pulley, 4 inches
3. Setscrew, 5/16-18 x 1 1/2 in. (4)
4. Bearing unit (2)
5. V-belt
6. Pulley
7. Screw, cap, 3/8 x 1 1/2 in. (4)
8. Washer, flat, 3/8 in. (8)
9. Handwheel
10. Erdlator tank
11. Agitator motor base
12. Motor assembly
13. Effluent launder
14. Bracket (2)
15. Effluent launder leveling rod (3)
16. Electrical cable
17. Bridge rail
18. Control valve (CV-11)
19. Collar (2)
20. Erdlator drive shaft

Figure 3-35. Agitator Drive V-Belt, Removal



1. Erdlator agitator gear assembly
2. Flexible coupling
3. Chain for flexible coupling
4. Bearing unit (2)
5. Erdlator drive shaft
6. Screw, cap, 3/8-16 x 1 in. (4)
7. Washer, lock, ET, 3/8 in. (8)
8. Nut, 3/8-16 (8)
9. Lubrication fitting
10. Mounting bracket (2)
11. Motor mount plate
12. Screw, cap, 3/8-16 x 1 in. (4)
13. Erdlator agitator shaft
14. Flexible coupling
15. Mounting bracket (2)
16. Gear assembly input shaft
17. Setscrew
18. Lubrication fitting
19. Retaining ring
20. Setscrew (2)

Figure 3-36. Agitator Gear Assembly and Coupling, Removal



TS 4610-221-34/3-37

1. Cable
2. Connector nut
3. Seal
4. Grommet
5. Plug, oil, 1/4-20 x 1/4 in. (2)
6. Cable connector
7. Motor assembly
8. Key, machine, square, 1/8 x 1 1/8 in.
9. Pulley
10. Setscrew, 5/16-18 x 1/2 in.
11. Gasket
12. Junction box cover
13. Screw, machine, No. 8-32 x 3/8 in. (4)
14. Wire nut (3)

Figure 3-37. Erdlator Agitator Motor Assembly, Partially Exploded View

tor motor base (2) to the motor mount plate (6)

(17) Lift the agitator motor base (2) from the motor mount plate (6).

(18) Remove the flexible coupling cover (5, fig. 3-39) by removing the screws (19), gaskets (20), seals (17) and washers (18).

(19) Loosen the setscrew (3) that secures the gear assembly input shaft (16, fig. 3-36) to the flexible coupling (2). Remove the erdlator drive shaft (5), with bearings unit (4) and relible coupling (2) from the mounting brackets (10).

(20) Remove the machine key (1, fig. 3-39) from the gear assembly input shaft (16, fig. 3-36).

(21) Remove the cover from the flexible coupling (14, fig. 3-36).

(22) Remove the master link in the flexible coupling chain (3) and remove the flexible coupling chain from the two halves of the flexible coupling (14).

(23) Remove the two setscrews (20) that secure the flexible coupling (14) to the gear assembly output shaft and the erdlator agitator shaft (13).

(24) Remove the four nuts (8), lockwashers, and capscrews (12) and remove the erdlator agitator gear assembly (1) from the two mounting brackets (14). At the same time, slide the gear assembly output shaft out of the flexible coupling and remove the machine key from the gear assembly output shaft.

(25) Remove the other four nuts (8), lockwashers, and capscrews (12) and remove the two mounting brackets (15).

(26) Remove the flexible coupling (14) from the erdlator agitator shaft.

(27) Remove the cover from the flexible coupling (2).

(28) Loosen the setscrew and remove half of the flexible coupling (2) and the machine key from the gear assembly input shaft (16).

(29) Loosen the two setscrews (17, fig. 3-36) in the inner race of the agitator shaft bearing (10, fig. 3-34).

(30) Remove the retaining ring (19, fig. 3-36) that secures the agitator shaft (13) above the agitator shaft bearing and gently lower the agitator shaft into the downcomer tube.

(31) Remove the four nuts, lockwashers (3, fig. 3-34) and capscrews (6) and slide the agitator shaft bearing (10) off the agitator shaft.

(32) Remove the lubrication fitting (18, fig. 3-36) from the agitator shaft bearing.

(33) Prior to removal of the effluent launde leveling rod, tie the effluent launder (9, fig. 3-40 to the bridge rail (8) to support it after the leveling rod is removed.

(34) Remove the pin (11) and washer (10) from the leveling rod (3).

(35) Mark the position of the lower collar (4). Remove the setscrew (5) from the lower collar and remove the leveling rod from the effluent launder (9), collar (4), and support (12).

(36) Mark the position of the upper collar (4). Remove the setscrew (5) from the upper collar and remove the upper collar from the leveling rod.

(37) Remove the pin (2) and remove the handwheel (1) from the leveling rod.

(38) Remove two cap screws and remove the effluent launder nut (7) from the effluent launder.

(39) Remove and disassemble the other two effluent launder leveling rods in a similar manner.

(40) Loosen the screw in each hose clamp (2, fig. 3-41) and slide the hose clamp off the rubber boot (3).

(41) Remove the rubber boot from between the wet well tank (1) and the effluent launder (4).

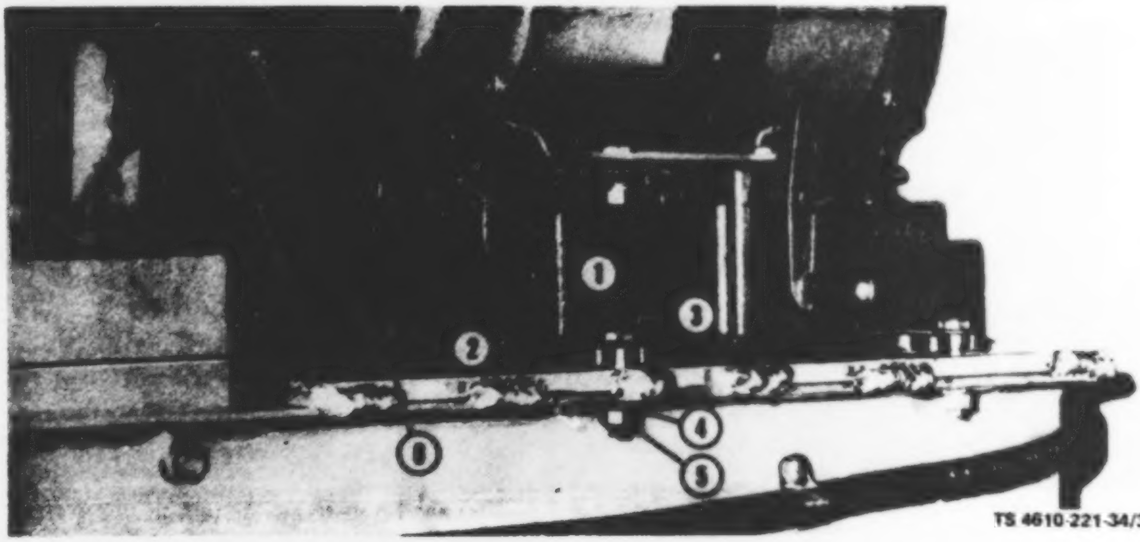
(42) Remove the hose clamp (2) from the wet well tank and the effluent launder

(43) Remove the four nuts (5, fig. 3-42), lockwashers (4), beveled washers (8), and screws (9) and remove the mounting plate (3) from the two bridge rails (12).

(44) Remove the four nuts (5), fiber washers, lockwashers (4), and screws (10) and remove the influent launders (1).

(45) Remove the other influent launder in a similar manner.

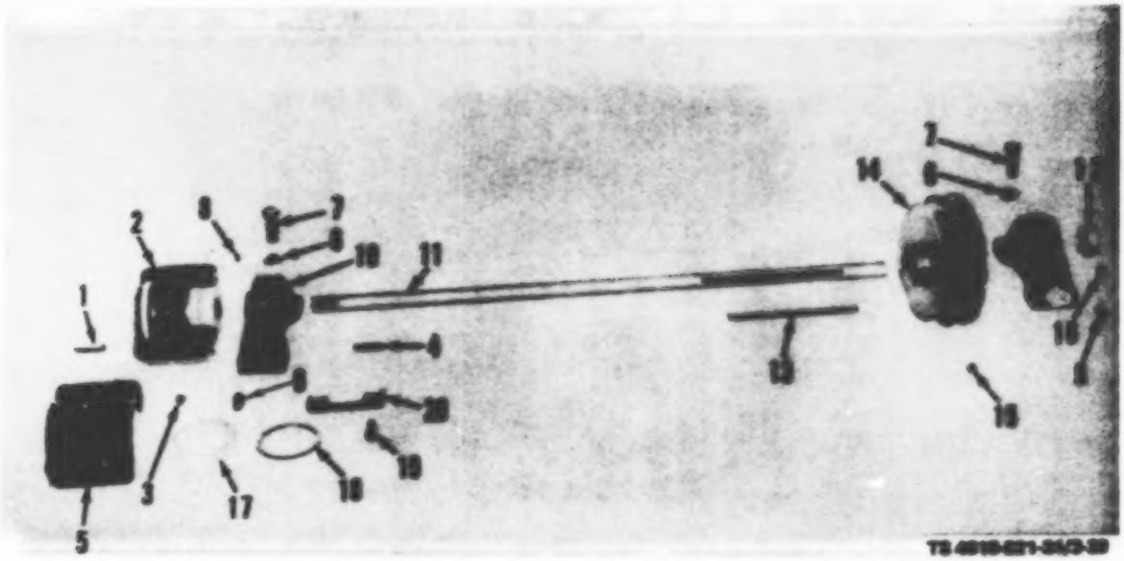
(46) Remove a pipe plug from the bottom of each influent launder.



TS 4610-221-34/3-38

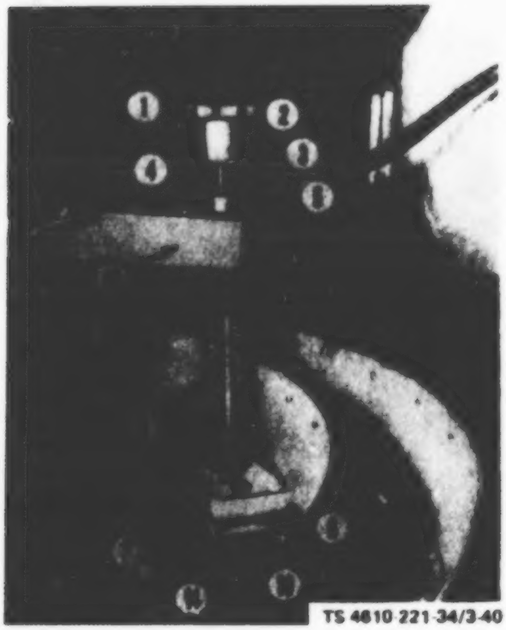
1. Screw, cap, hex hd, 3/8-16 x 1 1/4 in . (4)
2. Agitator motor base
3. Washer (4)
4. Washer (4)
5. Nut, plain, hex, 3/8-16 (4)
6. Motor mount plate

Figure 3-38. Agitator Motor Base, Removal



1. Key, machine, 1/8 x 1 in.
2. Flexible coupling
3. Setscrew, 1/4-20 x 1/4 in. (3)
4. Key, machine, 3/16 x 1 in.
5. Flexible coupling cover
6. Lockwasher, 3/8 in. (4)
7. Screw, cap, 3/8-16 x 1 in. (4)
8. Setscrew, No. 8-32 x 5/16 in. (4)
9. Lubrication fitting, 1/4-28 (2)
10. Bearing unit (2)
11. Erdlator drive shaft
12. Collar
13. Key, machine, 3/16 x 3/16 x 4 in.
14. Pulley
15. Setscrew, 5/16-18 x 5/16 in.
16. Setscrew
17. Seal (2)
18. Washer (2)
19. Screw (4)
20. Gasket (2)

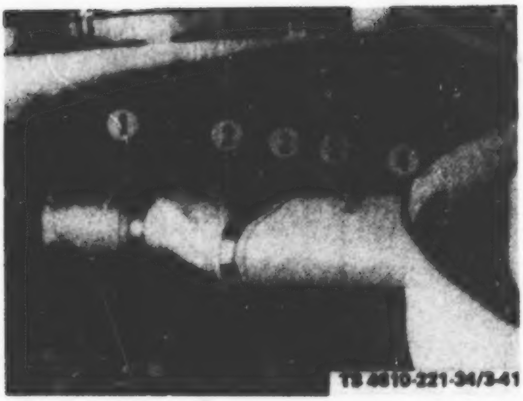
Figure 3-39. Erdlator Agitator Drive Shaft, Exploded View



TS 4610-221-34/3-40

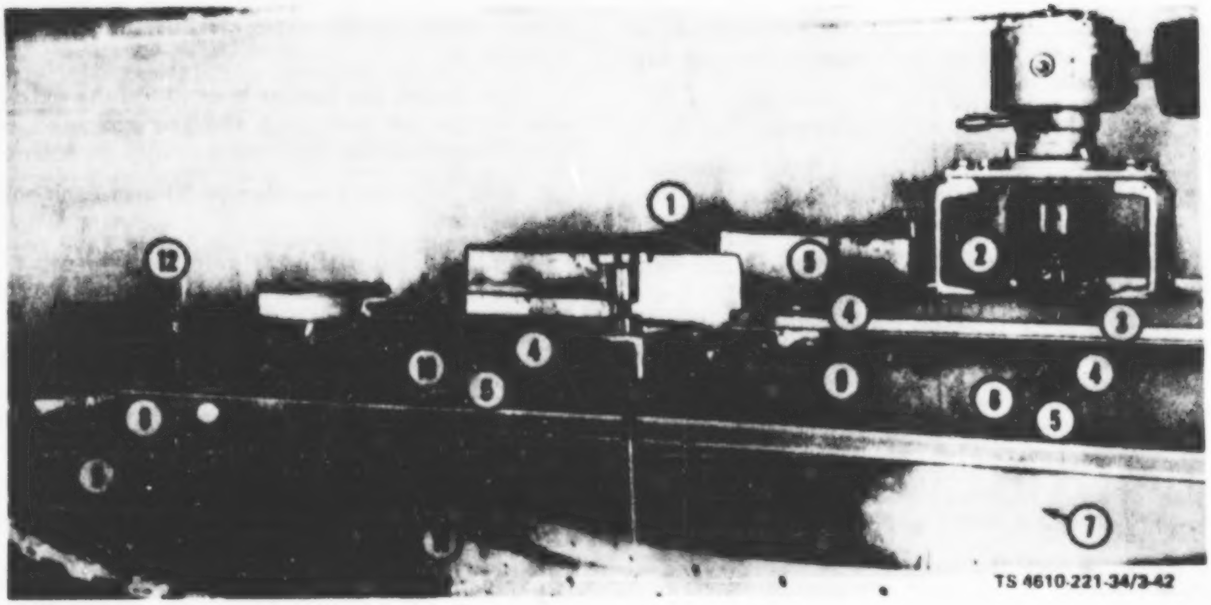
1. Handwheel
2. Pin, straight, headless, 1/8 x 3/4 in.
3. Leveling rod
4. Collar (2)
5. Setscrew, 1/4-20 x 1/2 in. (2)
6. Nut, self-locking, 3/8-24
7. Effluent launder nut
8. Bridge rail
9. Effluent launder
10. Flat washer, 3/8 in.
11. Cotter pin, 3/32 x 3/4 in.
12. Support

Figure 3-40. Effluent Launder Leveling Rod, Removal


TS 4610-221-34/3-41

1. Wet well tank
2. Hose clamp, 18 in. dia. (2)
3. Rubber boot 4 1/2 id x 6 long
4. Effluent launder

Figure 3-41. Effluent Launder Rubber Boot, Removal



TS 4610-221-34/3-42

1. Influent launder (2)
2. Agitator
3. Mounting plate
4. Lockwasher, 3/8 in. (24)
5. Nut, plain, hex, 3/8-16 (24)
6. Screw, machine, 3/8-16 x 1 1/4 in. (8)
7. Downcomer tube
8. Washer, beveled, 3/8 in. (12)
9. Screw, cap, 3/8-16 x 1 1/4 in. (8)
10. Screw, machine, pan hd, 3/8-16 x 1 1/4 in. (8)
11. Effluent launder
12. Bridge rail (2)

Figure 3-42. Influent and Effluent Launders, Removal

(47) Remove the eight nuts (5, fig. 3-42), lockwashers, beveled washers (8), and screws (9) and remove the two bridge rails (12) from the erdlator tank.

(48) Remove four nuts, lockwashers, bevel washers, and screws and remove the rail support between the bridge rails.

(49) Remove the effluent launder (11, fig. 3-42) from the erdlator tank.

b. Cleaning, Inspection, and Repair.

(1) Clean the effluent launder with a solution of soap and warm water and rinse thoroughly.

(2) Inspect the effluent launder for cracks, dents, bends, and broken welds.

(3) Repair the effluent launder by welding cracks or replace if otherwise unserviceable.

(4) Clean the influent launders with a solution of soap and warm water and rinse thoroughly.

(5) Inspect the influent launders for damage.

(6) Weld all cracks or tears. Replace a launder that is twisted or bent and cannot be straightened.

c. Installation.

(1) Install the effluent launder (11, fig. 3-42) in the erdlator tank.

(2) Position the rail support between the bridge rails (12) and secure with the four screws (9), beveled washers (8), lockwashers, and nuts (5).

(3) Position the two bridge rails (12) on the erdlator tank and secure with eight screws (9), bevel washers (8), lockwashers, and nuts (5).

(4) Install a pipe plug in the bottom of each influent launder (1).

(5) Position the influent launder (1) between the bridge rails (12) and secure with the four screws (10), lockwashers (4), fiber washers, and nuts (5).

(6) Install the other influent launder in a similar manner.

(7) Position the mounting plate (3) on the two bridge rails (12) and secure with the four screws (9), beveled washers (8), lockwashers (4) and nuts (5).

(8) Install one hose clamp (2, fig. 3-41) on the extension of the wet well tank (1) and the other clamp on the extension of the effluent launder (4).

(9) Install the rubber boot (3) on the extension of the wet well tank and the extension of the effluent launder, spacing it evenly on both.

(10) Slide the hose clamps (2) over each end and tighten.

(11) Position the effluent launder nut (7, fig. 3-40) on the effluent launder (9) and secure with two capscrews.

(12) Install the handwheel (1) on the end of the leveling rod (3), aligning the pin holes in each and drive the pin (2) through the aligned holes.

(13) Install the upper collar (4) on the leveling rod, at the location previously marked, and secure with the setscrew (5).

(14) Insert the leveling rod through support (12), lower collar (4), and into the effluent launder (9).

(15) Secure the lower collar (4) to the leveling rod (3), at the location previously marked, and secure with the setscrew (5).

(16) Secure the leveling rod (3) to the effluent launder (9) with the washer (10) and pin (11).

(17) Remove the material that was used to tie the effluent launder to the bridge rail (8).

(18) Reassemble and install the other two effluent launder leveling rods in a similar manner.

(19) Install the lubrication fitting (18, fig. 3-36) in the agitator shaft bearing (10, fig. 3-34).

(20) Position the agitator shaft bearing (10) over the agitator shaft (13, fig. 3-36) and on the motor mount plate (12, fig. 3-34) and secure with the four nuts, lockwashers (8), and capscrews (6).

(21) Lift the agitator shaft (13, fig. 3-36) and install the retaining ring (19) above the agitator shaft bearing (10, fig. 3-34).

(22) Tighten the two setscrews (17, fig. 3-36) to secure the inner race of the agitator shaft bearing (10, fig. 3-34) to the agitator shaft (13,

fig. 3-36).

(23) Install half of the flexible coupling (2, fig. 3-39) and the machine key on the gear assembly input shaft (16) and secure wtih a setscrew.

(24) Install the cover on the flexible coupling (2).

(25) Install the flexible coupling (14) on the erdlator agitator shaft (13) and secure with one setscrew (9).

(26) Install the two mounting brackets (15) and secure with the four nuts (8), lockwashers, and capscrews (12).

(27) Position the erdlator agitator gear assembly (1) on the mounting brackets (15) inserting the gear assembly output shaft into the flexible coupling (14).

(28) Secure the gear assembly output shaft to the flexible coupling (14) with the other setscrew.

(29) Secure the erdlator agitator gear assembly (1) to the mounting brackets (15) with the four nuts (8), lockwashers and capscrews (12).

(30) Position the flexible coupling chain (3) over the two halves of the flexible coupling (2) and secure the flexible coupling chain together with the master link.

(31) Install the cover on the flexible coupling (14).

(32) Install the two mounting brackets (10, fig. 3-36) on the motor mount plate (11) and secure with four nuts (8), lockwashers (7), and capscrews (6).

(33) Install the machine key (1, fig. 3-39) in the gear assembly input shaft (16, fig. 3-36). Position the bearing units (4) to the mounting brackets (10) and, at the same time, slide the flexible coupling (2) over the machine key in the gear assembly input shaft (16).

(34) Secure the two bearing units (4) to the mounting brackets (10) with the two nuts (8), lockwashers (7), and capscrews (6).

(35) Pull the agitator drive shaft toward the erdlator agitator gear assembly (1) and secure the flexible coupling (2) to the gear assembly input shaft (16) with a setscrew.

(36) Tighten the two setscrews (8, fig. 3-39) in each bearing unit (4, fig. 3-36) to secure the bearings to the erdlator drive shaft (5).

(37) Install the flexible coupling cover (5, fig. 3-39) by installing the washers (18), seals (17), gaskets (20) and screws (19).

(38) Position the agitator motor base (2, fig. 3-38) on the motor mount plate (6).

(39) Secure the back of the agitator motor base (2) to the motor mount plate (6) with two screws (1) and washers (3,4) and nut (5).

(40) Position the motor assembly (12, fig. 3-35) on the agitator motor base (11) and secure with the four nuts, lockwashers, capscrews (7) and eight flat washers (8).

(41) Position the cable on the rear bridge rail and retain in place with the clamps.

(42) Install the cable connector (6, fig. 3-37) in the motor assembly (7).

(43) Insert the four electrical leads of the cable (1) through the cable connector nut (2), seal (3), and grommet (4).

(44) Thread the four electrical leads of the cable through the cable connector (6) and into the junction box of the motor assembly. Pull the cable connector nut down the cable and screw it onto the cable connector (6).

(45) Join the three electrical leads of the cable (1) to the electrical leads of the motor assembly (7) and secure with the wire nuts (14). Bind the wire nuts in place with electrical tape.

NOTE

Alternating current creates a vibration between electrical connections. If electrical connections are not securely bound together, failure, due to loose connections, may result during operation.

(46) Connect the electrical cable into the control cabinet.

(47) Install the gasket (11) and junction box cover (12) on the motor assembly (7) and secure with the four screws (13).

(48) Install the new V-belt over the end of the erdlator drive shaft (20, fig. 3-35) and lower the erdlator drive shaft.

(49) Secure the two bearing units (4) to the brackets (10, fig. 3-36) with the four nuts (8), lockwashers (7), and capscrews (6).

(50) Position the V-belt (5, fig. 3-35) on the two pulleys (2 and 6).

(51) Turn the handwheel (9) clockwise to create a tension on the V-belt. The tension on the V-belt must be regulated so that it can be depressed one inch at a point midway between the two pulleys.

(52) Install the aspirator (2, fig. 3-34) on the end of the raw water piping above the influent launder (1) by turning it counterclockwise.

(53) Install the other three aspirators in a similar manner.

(54) Install the raw water pressure gage (3) and raw water piping on the aspirator manifold.

3-12. Three-Way Plug Valve (Filtered Water).

a. General. The filtered water three-way plug valve is located in the filtered water piping above the flow control valve. It directs the flow of filtered water to the storage tanks outside of the van body or recirculates the water to the wet well tank for refiltering.

b. Removal.

(1) Disconnect the pipe union (3, fig. 3-43) and remove the pipe nipple (4) with attached half union from the elbow.

(2) Remove the pipe elbow (5), with attached nipple from the other pipe elbow.

(3) Disconnect the two pipe unions (1) above and below the three-way plug valve (11) and swing the three-way plug valve to the right away from the diatomite filter.

(4) Turn the three-way plug valve (11) counterclockwise and remove it from the pipe nipple (7).

(5) Remove the two halves of the pipe unions from the close nipples (10) and remove the nipples from the three-way plug valve.

c. Disassembly.

NOTE

This paragraph does not apply for ETC Model S1500.

(1) Remove the setscrew (2, fig. 3-44) and remove the wrench (1).

(2) Remove the slotted plug (3) and the lubricating screw (4) from the center plug (11).

(3) Unscrew the base plate (13) and remove the spring (12), center plug (11), and spacer (8) from the body (7).

(4) Remove the check valve (9) and valve seat (10) from the stem of the center plug.

(5) Remove the drive screws (5) and designation plate (6), if replacement of the plate is necessary.

d. Cleaning, Inspection and Repair.

WARNING

Drycleaning solvent, P-D-680, used to clean parts is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Do not use near open flame or excessive heat. Flash point of solvent is 100 degrees F - 138 degrees F (38 degrees C - 59 degrees C).

(1) Clean all parts in cleaning solvent (item 1, App. C). Make sure all old lubricant is removed.

(2) Inspect the valve body and center plug for cracks, wear, and other damage. Replace the valve body or center plug, if damaged.

(3) Inspect the check valve, valve seat, and spring for wear and damage. Replace the check valve if the spring does not seat the ball firmly. Replace all other defective parts.

(4) Inspect the designation plate for illegible markings and replace if damaged or defective.

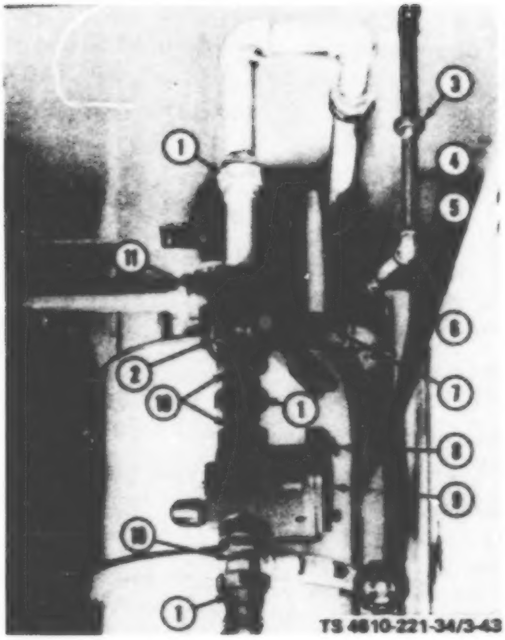
e. Reassembly.

(1) Install the check valve seat (10, fig. 3-44) and check valve (9) in the stem of the center plug (11).

(2) Position the spacer (8) and the center plug (11) in the body (7).

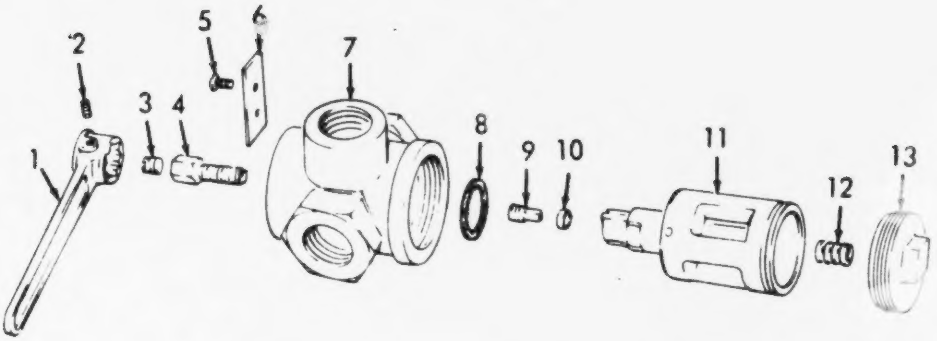
(3) Place the spring (12) on the bottom of the center plug (11) and install the base plate (13).

(4) Insert the new grease stick in the stem of the center plug (11) and install the lubricating screw (4) and slotted plug (3).



1. Unicn, pipe, 1 1/2 in. (3)
2. Instruction plate
3. Union, pipe, 1/2 in.
4. Nipple, pipe, 1/2 x 3 in.
5. Elbow, pipe, 90 degrees, 1/2 in. (2)
6. Nipple, pipe, 1/2 x 1 1/2 in.
7. Nipple, pipe, 1 1/2 x 3 in.
8. Draincock, 1/4 in.
9. Flow control valve
10. Nipple, close, 1 1/2 x 2 in. (3)
11. Valve, plug, 3-way, 2 port, 1 1/2 in.

Figure 3-43. Three-Way Plug Valve (Filtered Water) and Flow Control Valve, Removal



TS 4610-221-34/3-44

1. Wrench
2. Setscrew, 1/4-20 x 3/4 in.
3. Plug, slotted, 1/4-18
4. Lubricating screw
5. Screw, drive, No. 2 x 3/16 in. (2)
6. Designation plate
7. Body
8. Spacer
9. Check valve
10. Check valve seat
11. Center plug
12. Spring
13. Base plate

Figure 3-44. Three-Way Plug Valve, Exploded View

(5) Install the wrench (1), with the handle opposite the designation plate (6), and install the setscrew (2).

f. Installation.

(1) Install the two nipples (10, fig. 3-43) in the three-way plug valve (11) and install a half of the pipe union (1) on the nipple (10).

(2) Install the three-way plug valve (11) on the pipe nipple (7).

(3) Swing the three-way plug valve (11) back into the place so that it aligns with the filtered water piping. Connect the two pipe unions (1).

(4) Install the pipe nipple, with attached elbow (5), in the other pipe elbow (5).

(5) Install the pipe nipple (4), with attached pipe union (3), in the pipe elbow (5). Connect the pipe union (3).

(6) Lubricate the three-way plug valve as directed in the current lubrication order.

NOTE

The three-way plug valve does not require lubrication for ETC Model S1500, Series Nos. S1500-1 through S1500-50.

3-13. Flow Control Valve.

a. General. The flow control valve is located in the filtered water piping on the effluent side of the diatomite filter. The flow control valve regulates the flow of water through the diatomite filter assembly at a rate of 0 to 30 gallons per minute.

b. Removal.

(1) Separate the two pipe unions (1, fig. 3-43) and remove the flow control valve (9) from the filtered water piping.

(2) Remove the two halves of the pipe unions (1) from the close nipple (10) in the inlet and outlet sides of the flow control valve and remove the pipe nipples from the flow control valve.

c. Disassembly.

(1) Remove the two draincocks (17, fig. 3-45).

(2) Remove the two pipe plugs (7) from the valve body (8).

(3) Remove the eight capscrews (18) and lockwashers (19) from the valve body (20) and remove the valve body cover and diaphragm (23), as an assembly.

(4) Remove the two nuts (21) from the guide pins (24) and remove the guide pins separating the diaphragm (23) and backing plates (22) from the valve body cover (20).

(5) Lift the disk and stem assembly (13) with the valve seat (15), orifice (14), spring (27), spring seat (26), and nut (25) attached from the valve body (8).

(6) Remove the nut (25) from the disk and stem assembly (13) and separate the spring seat (26), spring (27), and valve seat (15) with orifice (14) from the disk and stem assembly (13).

(7) Remove the pin (16) and orifice (14) from the valve seat (15).

(8) Remove the nut (1) and slide the knob (2) off the shaft (10).

(9) Remove the setscrew (28) from the side of the pointer (3) and remove the pointer spring (4), packing gland (5), and flow valve packing (6) from the shaft (10).

(10) Slide the shaft (10) out the rear of the body (8). Drive out the grooved pin (29) and remove the gate orifice (12) and washer (11) from the shaft (10).

(11) Remove the sleeve union (9) from the body (8) if replacement is required.

d. Cleaning, Inspection, and Repair.

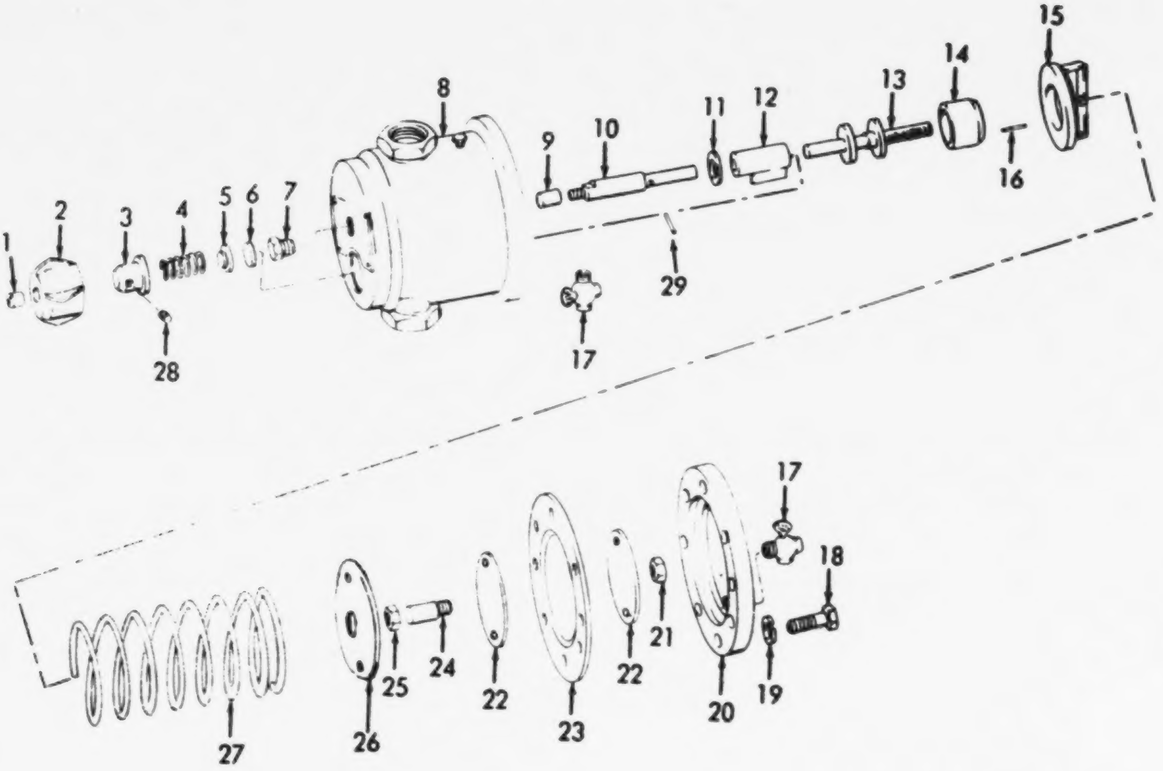
WARNING

Drycleaning solvent, P-D-680, used to clean parts is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Do not use near open flame or excessive heat. Flash point of solvent is 100 degrees F - 138 degrees F (38 degrees C - 59 degrees C).

(1) Clean the metal parts in cleaning solvent (item 1, App. C) and dry thoroughly.

(2) Clean the diaphragm in alcohol (item 2, App. C) or a nonmineral cleaning solvent (item 3, App. C).

best copy available


15
14
13
12
11
8
10
9
16
2
3
4
5
6
7
1
29
28
17
17
18
27
26
25
24
22
23
22
21
20
19

TS 4610-221-34/3-45

1. Nut (spec)
2. Knob
3. Pointer
4. Spring
5. Packing gland
6. Flow valve packing
7. Plug, pipe, brass, 1/8-27 (2)
8. Body
9. Sleeve union
10. Shaft
11. Washer (spec)
12. Gate orifice
13. Valve disk and stem assembly
14. Orifice
15. Valve seat
16. Pin, grooved, 5/32 x 1/2 in.
17. Draincock, 1/8 in. (2)
18. Screw, cap, brass, 5/16-18 x 1 in. (8)
19. Washer, lock, 5/16 in. (8)
20. Valve body cover
21. Nut, self-locking, brass, No. 10-32 (2)
22. Backing plate (2)
23. Diaphragm
24. Guide pin (2)
25. Nut, brass, 5/16-18
26. Spring seat
27. Spring
28. Setscrew, 1/4-20 x 1/4 in.
29. Pin grooved, 3/32 x 1/2 in.

Figure 3-45. Flow Control Valve, Exploded View

(3) Inspect the diaphragm for cracks and signs of wear. Replace a defective diaphragm.

(4) Inspect the shaft and body for damaged threads and misalignment. Replace a damaged or misaligned shaft or body.

(5) Inspect the springs and replace them if they are cracked, broken, or show signs of being weak.

(6) Inspect the orifice and valve seat and replace them if either are badly pitted or cracked.

e. Reassembly.

(1) Install a new sleeve union (9, fig. 3-45) in the body (8) if the old one was removed.

(2) Assemble the washer (11) and gate orifice (12) on the shaft (10), with the holes aligned, and secure the gate to the shaft with the pin (29).

(3) Insert the shaft (10) through the rear of the body (8) so the washer (11) is seated in the hole.

(4) Install a new flow valve packing (6) and secure it with the packing gland (5), spring (4), and pointer (3). Install the setscrew (28) in the pointer and tighten it securely.

(5) Position the knob (2) over the pointer and install the nut (1) on the end of the shaft (10).

(6) Position a backing plate (22) on each side of the diaphragm (23) and secure them with the two guide pins (24) and brass nuts (21).

(7) Press the orifice (14) into the valve seat (15) and install the grooved pin (16) in the outer rim of the valve seat. The pin prevents the valve seat from turning in the valve body (8).

(8) Slide the disk and stem assembly (13) through the hole in the seat (15) until the valve is resting on the seat.

(9) Position the spring (27) on the valve seat (15) and place the spring seat (26) over the threaded end of the disk and stem assembly (13). Compress the spring and secure it with the nut (25).

(10) Install the disk and stem assembly (13), with the valve seat (15) and spring (27) attached, in the body (8).

(11) Position the diaphragm assembly in the valve body cover (20).

(12) Position the valve body cover (20) and diaphragm assembly on the spring seat (26) with the guide pins (24) through the holes in the spring seat.

(13) Install the valve body cover (20) on the valve body (8) and secure with the eight capscrews (18) and lockwashers (19).

(14) Install and close the two draincocks (17).

(15) Install the two plugs (7)

f. Installation.

(1) Install the two pipe nipples in the inlet and outlet sides of the flow control valve. Install the two halves of the pipe union (1, fig. 3-43) on the close nipple (10).

(2) Position the flow control valve (9) in the filtered water piping and connect the two pipe unions (1).

3-14. Three-Way Plug Valve (Coagulated Water).

a. General. The coagulated water three-way plug valve is located in the coagulated water piping to the left of the diatomite filter assembly. It directs the flow of coagulated water to the influent section of the diatomite filter assembly for filtering or to the wash ring of the diatomite filter assembly for flushing the lower filter shell.

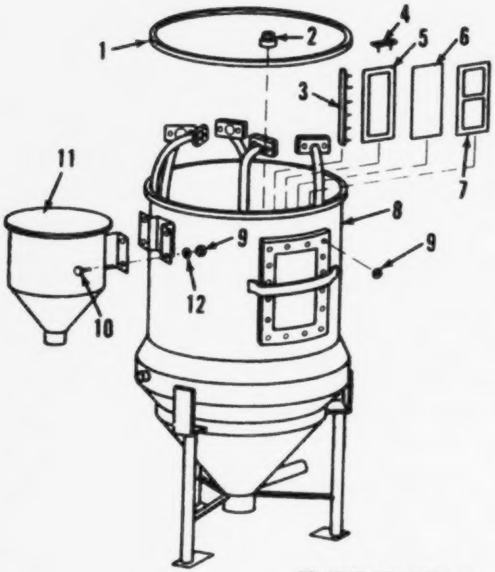
b. Removal.

(1) Remove the four nuts (9, fig. 3-46), lockwashers (12), and capscrews (10) and separate the precoat funnel (11) from the filter housing (8).

(2) Remove the precoat funnel (11) from the coagulated water piping to the three-way plug valve.

(3) Disconnect the pipe unions and slip joint couplings that connect the piping to the three-way plug valve (3, fig. 3-47 or 3-48) and remove the three-way plug valve with attached piping.

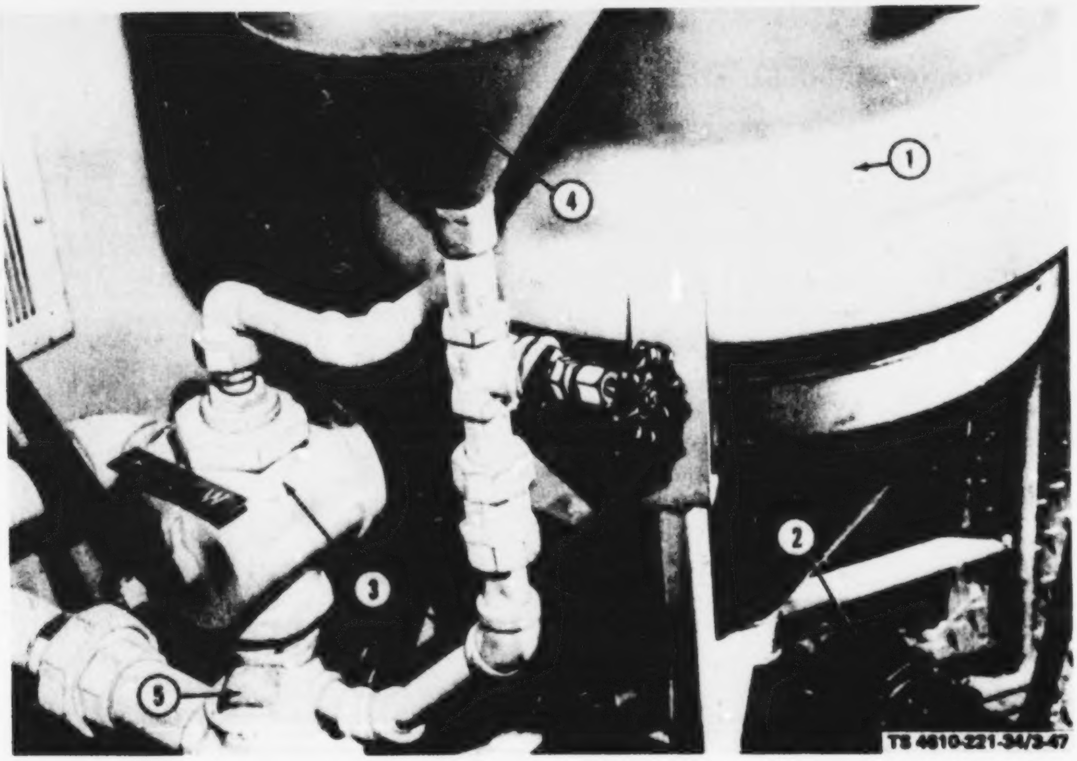
(4) Remove all the pipe fittings from the three-way plug valve (3).



TS 4610-221-34/3-46

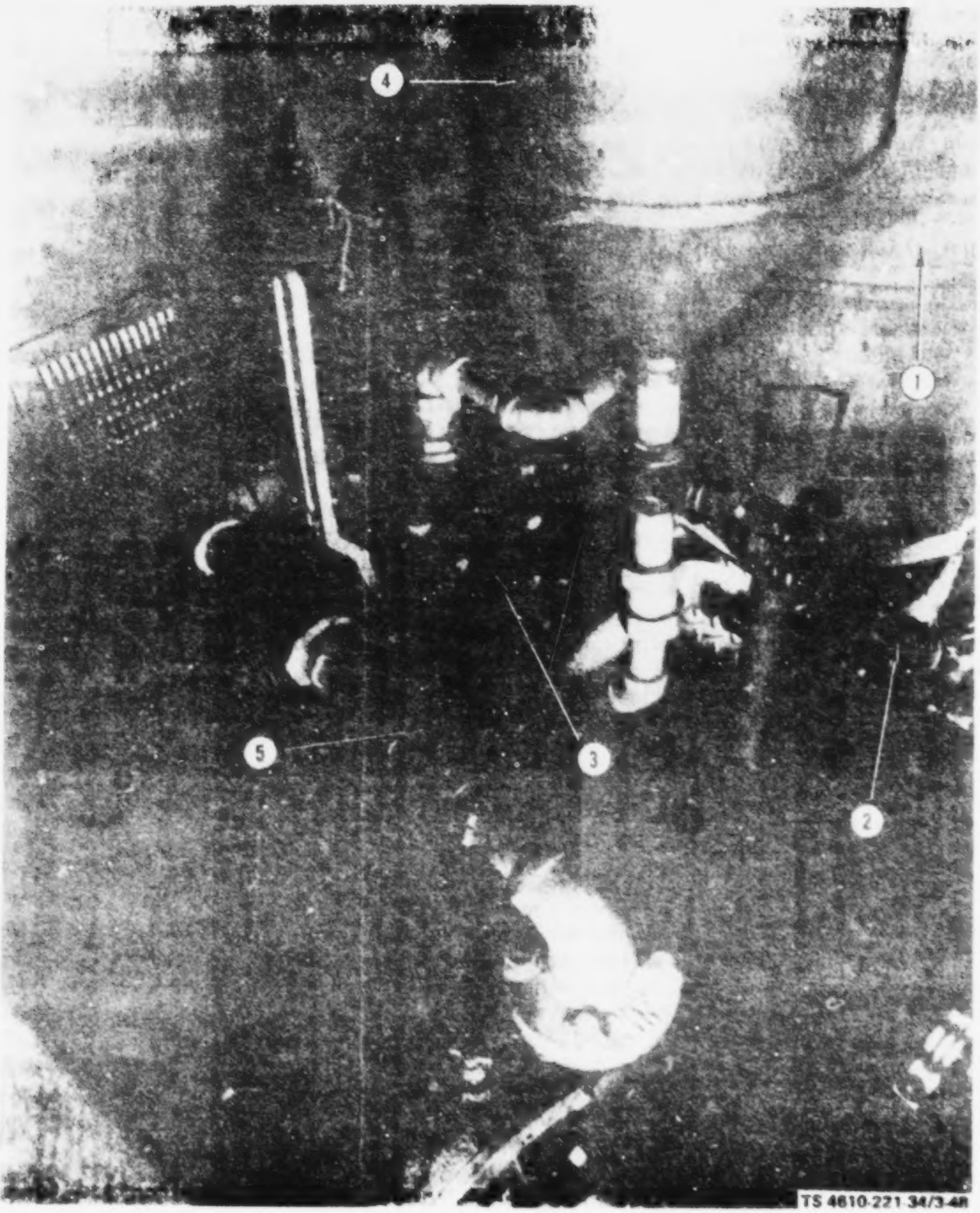
1. Flange gasket
2. Adapter bushing (6)
3. Long window strip (2)
4. Short window strip (2)
5. Inside window gasket
6. Window
7. Outside window gasket
8. Filter housing
9. Nut, hex, 1/4-20 (20)
10. Screw, cap, 1/4-20 x 5/8 in. (4)
11. Precoat funnel
12. Lockwasher, 1/4 in. (4)

Figure 3-46. Precoat Funnel, Removal



1. Diatomite filter assembly
2. Drain valve (DV-48)
3. Three-way plug valve (CV-36)
4. Precoat funnel
5. Control valve (CV-35)

Figure 3-47. Three-Way Plug Valve (Coagulated Water), Removal (MET-PRO Model 1500-2600A)


4
1
5
3
2
TS 4610-221-34/3-48

1. Diatomite filter assembly
2. Drain valve (DV-48)
3. Three-way plug valve (CV-36)
4. Precoat funnel
5. Control valve (CV-35)

Figure 3-48. Three-Way Plug Valve (Coagulated Water) Removal (ETC Model S1500)

c. Disassembly.

NOTE

This paragraph does not apply for ETC Model S1500.

(1) Remove the setscrew (2, fig. 3-44) and remove the wrench (1).

(2) Remove the slotted plug (3) and the lubricating screw (4) from the center plug (11).

(3) Unscrew the base plate (13) and remove the spring (12), center plug (11), and spacer (8) from the body (7).

(4) Remove the check valve (9) and valve seat (10) from the stem of the center plug.

(5) If replacement of the plate is necessary, remove the drive screws (5) and designation plate (6).

d. Cleaning, Inspection and Repair.

WARNING

Drycleaning solvent, P-D-680, used to clean parts is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Do not use near open flame or excessive heat. Flash point of solvent is 100 degrees F - 138 degrees F (38 degrees C - 59 degrees C).

(1) Clean all parts in cleaning solvent (item 1, App. C). Make sure all old lubricant is removed.

(2) Inspect the valve body and center plug for cracks, wear, and other damage. Replace the valve body or center plug, if damaged.

(3) Inspect the check valve, valve seat, and spring for wear and damage. Replace the check valve if the spring does not seat the ball firmly. Replace all other defective parts.

(4) Inspect the designation plate for illegible markings and replace if damaged or defective.

e. Reassembly.

(1) Install the check valve seat (10, fig. 3-44) and check valve (9) in the stem of the center plug (11).

(2) Position the spacer (8) and the center plug (11) in the body (7).

(3) Place the spring (12) on the bottom of the center plug (11) and install the base plate (13).

(4) Insert a new grease stick in the stem of the center plug (11) and install the lubricating screw (4) and slotted plug (3).

(5) Install the wrench (1), with the handle opposite the designation plate (6), and install the setscrew (2).

f. Installation.

(1) Install all the pipe fittings on the three-way plug valve (3, fig. 3-47 or 3-48) in a similar pattern to that from which they were removed.

(2) Position the three-way plug valve, with attached piping, in the piping system and connect the pipe unions and slip joint couplings.

(3) Install the precoat funnel (11, fig. 3-46) on the coagulated water piping to the three-way plug valve.

(4) Position the precoat funnel (11), on the left side of the filter housing (8) and secure with the four capscrews (10), lockwashers (12) and nuts (9).

(5) Lubricate the three-way plug valve in accordance with the current lubrication order.

NOTE

The three-way plug valve does not require lubrication for ETC Model S1500, Series Nos. S1500-1 through S1500-50.

3-15. Air Release Valve.

a. General. The air release valve is located on the top of the diatomite filter assembly. It releases air trapped in the filter housing cover or the effluent side of the filter element. When the air release valve is open, the air pressure trapped in the filter housing cover is suddenly released, allowing the air in the filter element air traps to expand with the effect of a blast which knocks the diatomaceous earth and foreign matter off the filter element for backwashing.

WARNING

Air that is released from the pressure valve can cause serious in-

jury to personnel standing too close.

b. Removal. Remove the six capscrews (4, fig. 3-49) and lockwashers (3) and remove the air release valve (1) and gasket (5) from the filter housing cover (2).

c. Disassembly.

(1) Remove the tube assembly (12, fig. 3-50) from the elbow (14) to separate the three-way valve (15) from the other part of the air release valve.

(2) Remove the three-way valve (15), nipple (3), bushing (2), and elbow (1), as an assembly, from the lower pressure plate (15, fig. 3-51) of the air release valve. Separate the components.

(3) Remove the machine screw (10, fig. 3-50), washer (9), and lockwasher (8) and lift the lever (11) from the three-way valve (15).

(4) Remove nuts (4) and two screws (7) and remove nameplate (6) and backing plate (5) from the front of the three-way valve (15).

(5) Remove the check valve (13) and elbow (14) from the housing (6, fig. 3-51), then remove elbow from the check valve.

(6) Remove the 12 nuts (18), lockwashers (17), and capscrews (16) that secure the lower plate (15) and diaphragm (14) to the upper plate (9) and remove the lower plate and diaphragm.

(7) Unscrew the head (13) from the rod (10) and remove the spring (11). Slide the rod and attached parts out of the housing (6).

(8) Remove the three screws (21) and lockwashers (22) and separate the disk (2) from the retainer (4).

(9) Loosen the nut (5) and remove the screw (3), with the retainer (4) and nut (5) attached, from the rod (10). Remove the nut (5) and the retainer (4) from the screw (3).

(10) Remove the two capscrews (19) and lockwashers (20) and separate the housing (6) and upper plate (9).

d. Cleaning, Inspection, and Repair.

WARNING

Drycleaning solvent, P-D-680, used to clean parts is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Do not use near open flame or excessive heat. Flash point of solvent is 100 degrees F - 138 degrees F (38 degrees C - 59 degrees C).

(1) Clean all metal parts in cleaning solvent (item 1, App. C).

(2) Clean the diaphragm, gasket, and r tainer in alcohol (item 2, App. C), or a nonmineral cleaning solvent (item 3, App. C).

(3) Inspect the spring for loss of tension. Replace a damaged or defective spring.

(4) Inspect the diaphragm and rod for signs of wear. Replace a damaged or defective rod or diaphragm.

(5) Inspect the rubber seat on the disk to see if it is tight on the disk and not cracked or worn. Replace the disk if it is damaged or if the seat is loose or worn.

e. Reassembly and Installation.

(1) Insert the screw (3, fig. 3-51) through the center hole in the retainer (4) and install the nut (5).

(2) Install the screw (3) in the end of the rod (10) so that the screw seats in the rod an tighten the nut (5) against the end of the ro Then attach the assembly to the gasket side o the disk (2) with the three screws (21) and lockwashers (22).

(3) Position the upper plate (9) on the housing (6) and secure with the two capscrews (19) and lockwashers (20).

(4) Insert the rod (10), with disk (2) and retainer (4) attached, through the housing.

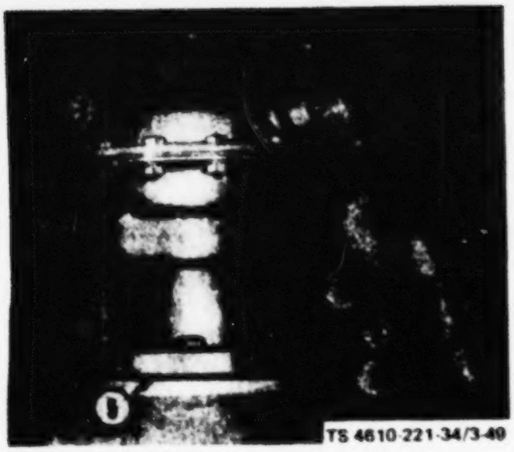
(5) Place the spring (11) over the rod and screw the head (13) on the rod so that it contacts the shoulder of the rod.

(6) Position the diaphragm (14) in the lower plate (15) with the holes aligned.

(7) Position the lower plate (15) over the upper plate (9), with the port in the lower plate aligned with the tapped hole in the housing, and install the 12 capscrews (16), lockwashers (17), and nuts (18).

(8) Assemble elbow (1, fig. 3-50), bushin (2), and nipple (3) on the three-way valve (15).

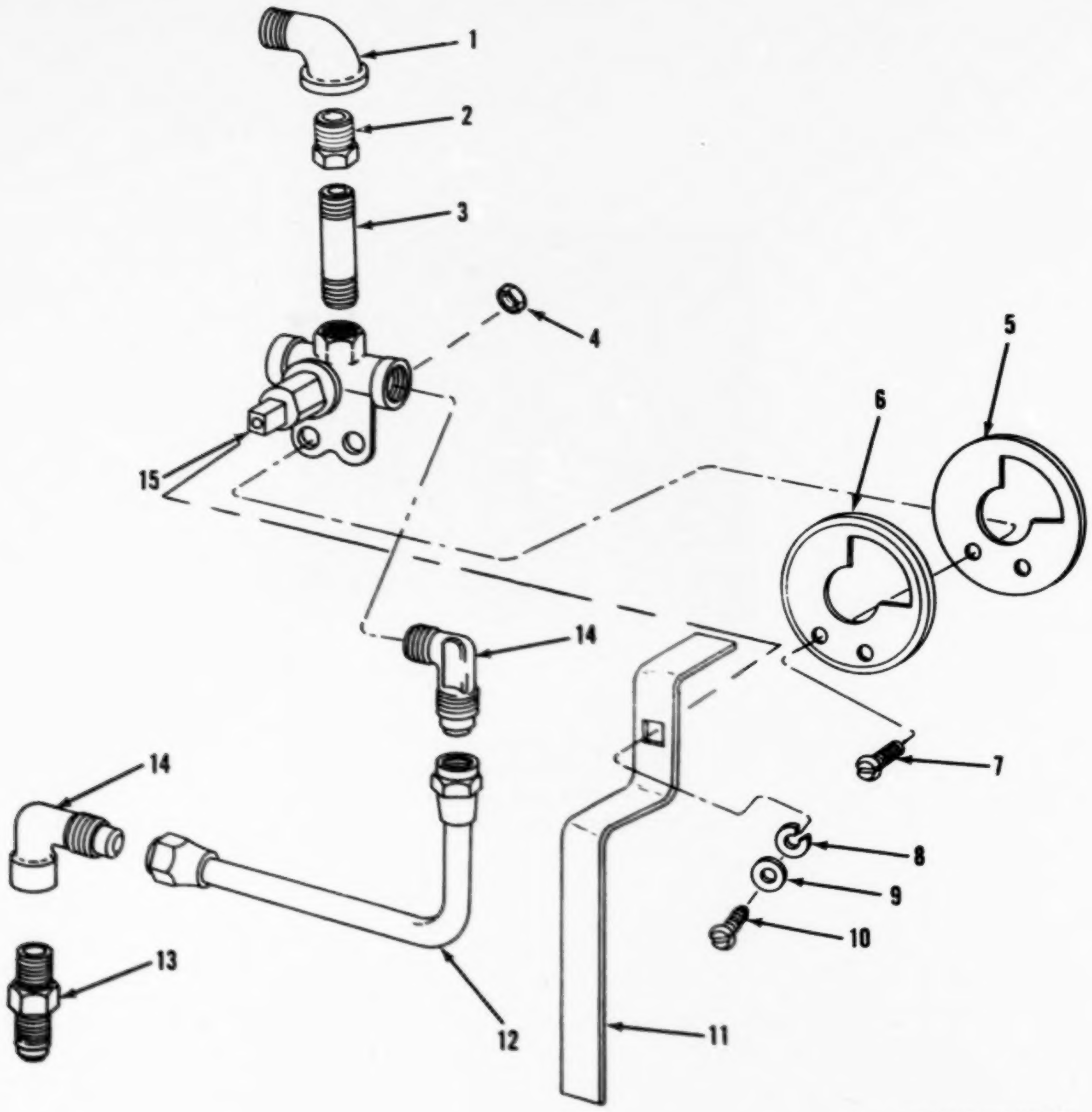
(9) Install and tighten one elbow (14) in the right side of the three-way valve (15).



TS 4610-221-34/3-49

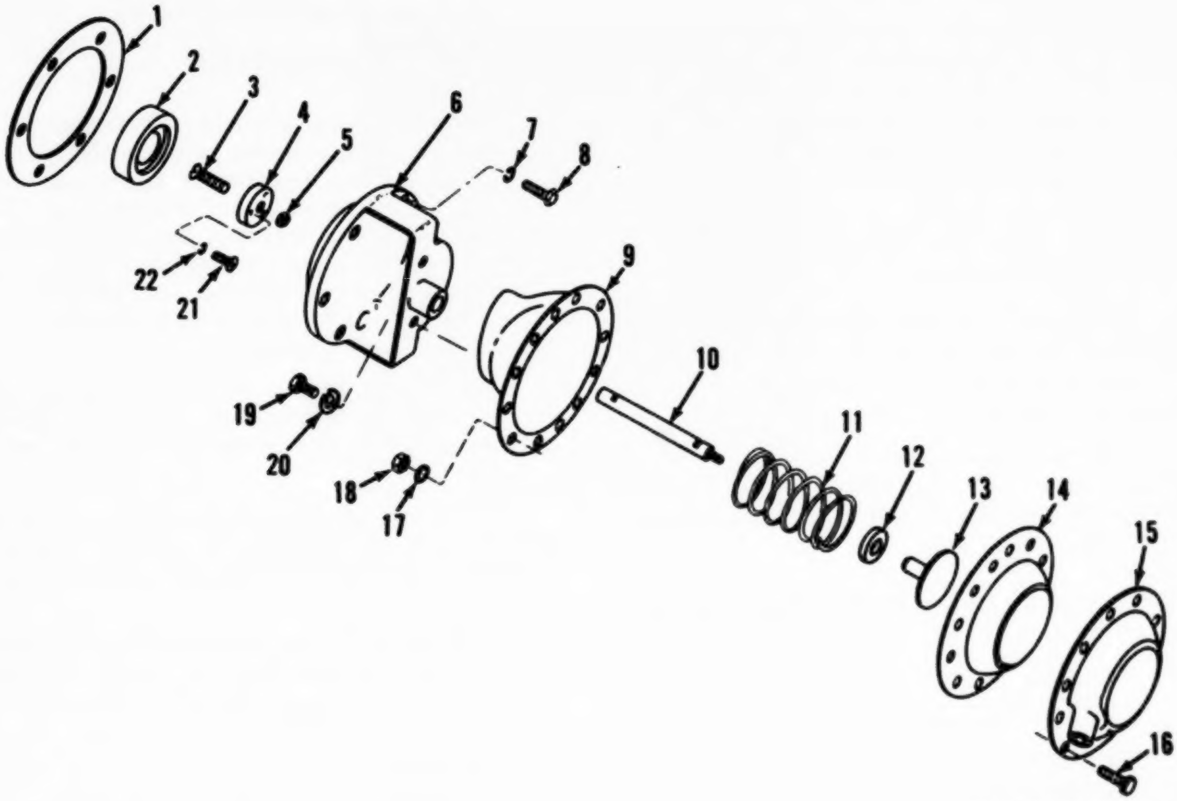
1. Air release valve
2. Filter housing cover
3. Lockwasher, 3/8 in. (6)
4. Screw, cap, 3/8-16 x 7/8 in. (6)
5. Gasket

Figure 3-49. Air Release Valve, Removal


1
2
3
4
5
6
15
14
14
7
8
9
10
13
12
11
TS 4610-221-34/3-50

1. Elbow, 1/4-18
2. Bushing, pipe, 1/4-18 x 1/8-27
3. Nipple, pipe, brass, 1/8-27 x 1 1/2 in.
4. Brass, hex, 1-24, 1/2 in. (2)
5. Backing plate
6. Nameplate
7. Screw, machine, brass, No. 10-24 x 1/2 in. (2)
8. Lockwasher, No. 6
9. Washer, flat, No. 6
10. Screw, machine, No. 6-32 x 3/8 in.
11. Lever
12. Tube assembly
13. Check valve
14. Elbow, pipe-to-tube, 7/16-20 x 1/8-27 (2)
15. Three-way valve

Figure 3-50. Air Release Three-Way Valve, Exploded View



TS 4610-221-34/3-51

1. Gasket	12. Spacer
2. Disk	13. Head
3. Screw, machine, 5/16-18 x 2 in.	14. Diaphragm
4. Retainer	15. Lower plate, pressure
5. Nut, plain, hex 5/16-18	16. Screw, cap, 1/4-28 x 3/4 in. (12)
6. Housing	17. Lockwasher, 1/4 in. (12)
7. Lockwasher, 3/8 in. (6)	18. Nut, plain, hex, 1/4-28 (12)
8. Screw, cap, 3/8-16 x 1 in. (6)	19. Screw, cap, 7/16-14 x 3/4 in. (2)
9. Upper plate, nonpressure	20. Lockwasher, 7/16 in. (2)
10. Rod	21. Screw, machine, brass, 1/4-20 x 5/8 in. (3)
11. Spring	22. Lockwasher IT, 1/4 in. (3)

Figure 3-51. Air Release Valve, Exploded View

(10) Position the backing plate (5) and nameplate (6) on the front of the three-way valve (15) and install the two screws (7) and nuts (4).

(11) Position the lever (11) over the square stem of the three-way valve (15) and install the screw (10), washer (9), and lockwasher (8).

(12) Screw the assembled three-way valve into the lower plate (15, fig. 3-51) with the nameplate facing away from the air release valve.

(13) Screw the check valve (13, fig. 3-50) into the threaded hole in the housing (6, fig. 3-51) and tighten securely.

(14) Install the lower elbow (14, fig. 3-50) in the top of the check valve (13).

(15) Install the tube assembly (12) on the elbows (14) and tighten the tube nut.

(16) Position the gasket (5, fig. 3-49) and air release valve (1) on the filter housing cover (2) and secure with the six lockwashers (3) and capscrews (4).

3-16. Erdlator Drive Shaft, Disk, Hub and Bushing.

a. Removal.

(1) Remove the mounting plate (para 3-11).

(2) Lift the agitator (2, fig. 3-42) off the bearing support (3, fig. 3-52).

(3) Remove the four screws (1) and lockwashers (2) and remove the bearing support (3) from the erdlator tank.

(4) Remove the setscrew and remove the bearing support shaft (5) from the bearing support (3).

b. Disassembly.

(1) Remove the two setscrews (4, fig. 3-53) from the agitator shaft (5).

(2) Remove the pins (6) from the hubs (2) and shaft.

(3) Remove the disks (1) from the shaft.

(4) Remove the rivets (9) and separate the hubs from the disks.

(5) Remove the sleeve bearing (3) from the agitator shaft.

(6) Press the bushing (8) with the upper shaft (7) from the agitator shaft.

(7) Press the bushing from the shaft.

c. Cleaning, Inspection and Repair.

WARNING

Drycleaning solvent, P-D-680, used to clean parts is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Do not use near open flame or excessive heat. Flash point of solvent is 100 degrees F - 138 degrees F (38 degrees C - 59 degrees C).

(1) Clean all parts with cleaning solvent (item 1, App. C). If necessary, use a wire brush to remove rust or foreign matter from the bearing support.

(2) Inspect the stud shaft and bearing support for cracks, excessively worn stub shaft, stripped or damaged threads, and other damage.

(3) Replace all unserviceable parts. Inspect the agitator shaft and disks for cracks and distortion. Straighten minor distortion or replace if otherwise unserviceable.

d. Reassembly.

(1) Align holes in bushing (8, fig. 3-53) with holes in upper shaft (7) and press shaft into bushing so that the lower end of the shaft is flush with bottom of the bushing and so that the holes are aligned.

(2) Press shaft and bushing assembly into shaft until holes are in line with holes for pins.

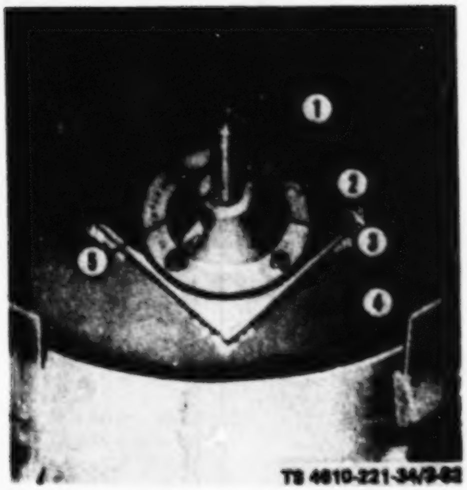
(3) Position hubs (2) on disks (1) and secure with rivets (9).

(4) Position the disk and hub assembly on the agitator shaft (5) and secure them with pins (6).

(5) Insert sleeve bearing (3) into the agitator shaft until approximately 1 1/2 inch is exposed, then secure in place with setscrews (4).

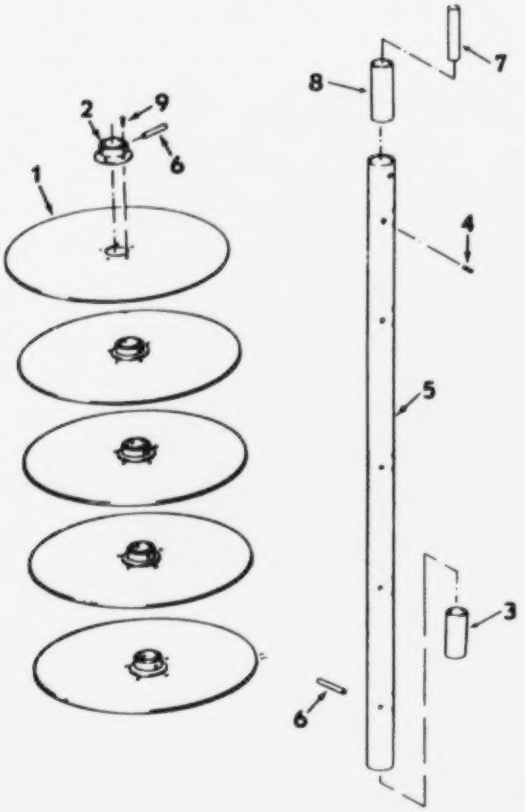
e. Installation.

(1) Install the bearing support shaft (5, fig. 3-52), the the bearing support (3) and secure with the setscrew.


1
2
3
5
4
TS 4610-221-34/3-82

1. Screw, cap, hex hd, 3/8-16 x 7/8 in. (4)
2. Lockwasher, 3/8 in. (4)
3. Bearing support
4. Erdlator tank
5. Bearing support shaft

Figure 3-52. Agitator Shaft and Bearing Support, Removal



TS 4610-221-34/3-53

1. Disk (5)
2. Hub (5)
3. Sleeve bearing
4. Setscrew, soc. hd, fl. pt, 10-24 x 1/2 in. (2)
5. Agitator shaft
6. Pin, headless, 1/4 x 3 in. (12)
7. Upper shaft
8. Bushing
9. Rivet, aluminum, 1/8 x 5/8 in. (40)

Figure 3-53. Agitator Shaft and Disk Assembly, Exploded View

(2) Position the bearing support (3) in the erdlator tank (4) and secure with the four lockwashers (2) and screws (1).

(3) Position the agitator (2, fig. 3-42) on the bearing support (3, fig. 3-52).

(4) Install the mounting plate (para 3-11).

3-17. Erdlator Agitator Gear Assembly.

a. General. The erdlator agitator gear assembly is located above the erdlator tank and drives the erdlator agitator. The gear assembly is driven by the electric motor through the agitator drive shaft at a ratio of 12.34 to 1.

b. Removal.

(1) Remove the cover from the flexible coupling (14, fig. 3-36).

(2) Remove the master link in the flexible coupling chain (3) and remove the flexible coupling chain from the two halves of the flexible coupling (14).

(3) Remove the two setscrews (20) that secure the flexible coupling (14) to the gear assembly output shaft and the erdlator agitator shaft (13).

(4) Remove the four nuts (8), lockwashers and capscrews (12) and remove the erdlator agitator gear assembly (1) from the two mounting brackets (15). At the same time, slide the gear assembly output shaft out of the flexible coupling and remove the machine key from the gear assembly output shaft.

(5) Remove the other four nuts (8), lockwashers, and capscrews (12) and remove the two mounting brackets (15).

(6) Remove the flexble coupling (14) from the erdlator agitator shaft.

(7) Remove the cover from the flexible coupling (2).

(8) Loosen the setscrew and remove half of the flexible coupling (2) and the machine key from the gear assembly input shaft (16).

c. Disassembly.

(1) Remove the closed cover (8, fig. 3-54) from the case (15) by removing screws (1).

(2) Remove plug (7) and grease fitting (6).

(3) Pry off cover (8) and gasket (9).

(4) Remove cone bearing and cup (10) from shaft (11).

(5) Remove caps (2 and 18) from the case (15) by removing screws (1).

(6) Pry off the caps and the gaskets (3 and 17).

(7) Remove cone bearings and cups (4).

(8) Remove shaft (16) from the case.

(9) Remove shaft (11) and gear (12) from the case.

(10) Remove spacer (14) and cone bearing and cup (10) from shaft (11).

(11) Remove pin (13) from gear (12). Slide gear (12) from shaft (11). Remove key (5).

(12) Remove oil seals (20).

(13) Remove pipe plugs (21).

(14) Remove oil seal (19) from cap (18).

d. Cleaning, Inspection, and Repair.

NOTE

Drycleaning solvent, P-D-680, used to clean parts is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Do not use near open flame or excessive heat. Flash point of solvent is 100 degrees F - 138 degrees F (38 degrees C - 59 degrees C).

(1) Clean all metal parts in cleaning solvent (item 1, App. C) and dry thoroughly.

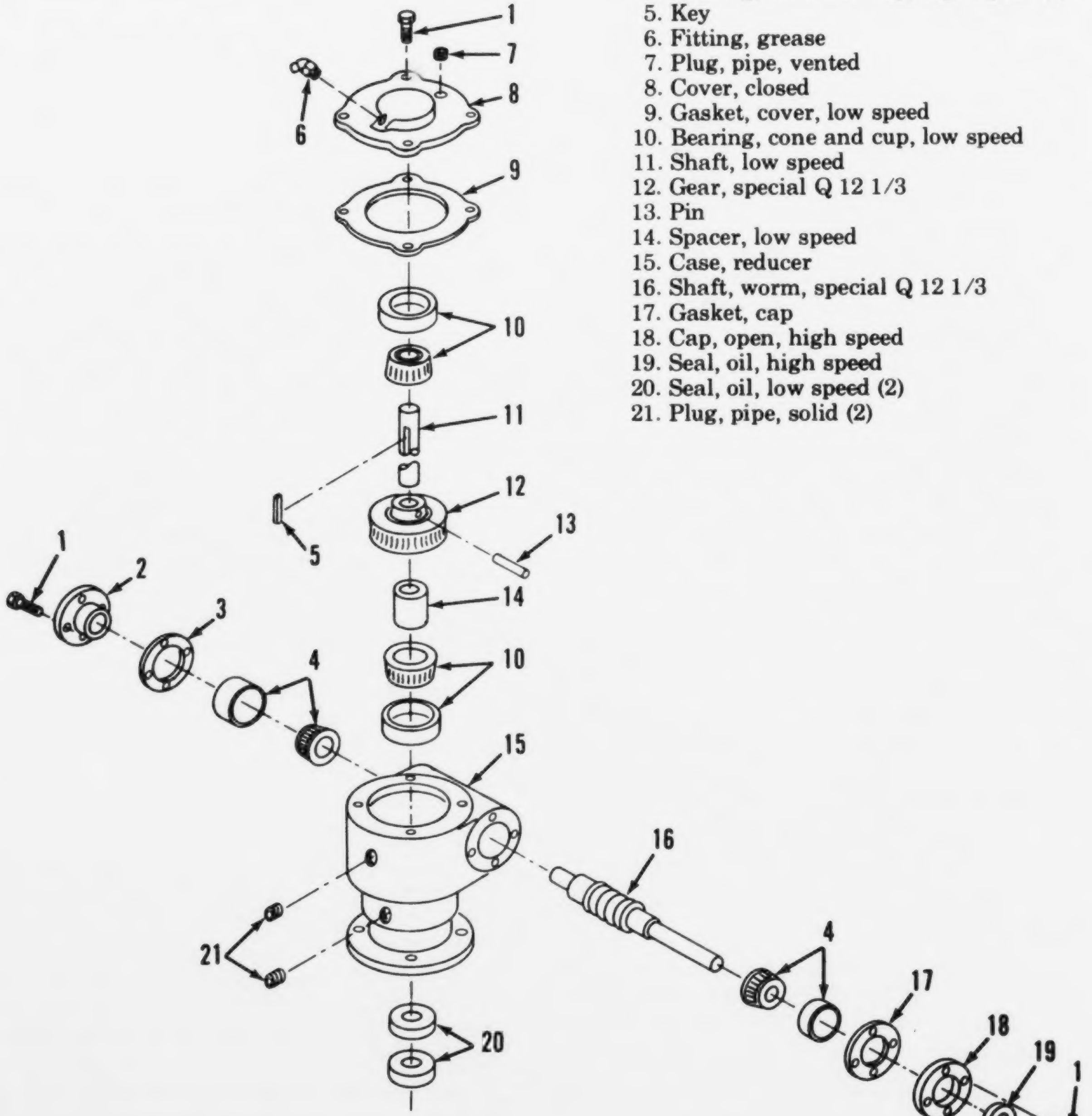
(2) Inspect the input and output shaft seals for wear, deterioration, bent or distorted casing, and other damage. Replace defective seals.

(3) Inspect the bearings for corroded or pitted surfaces and wear. Revolve the bearings by hand and check for rough spots. Repalce defective bearings.

(4) If the seals and bearings are in serviceable condition, cover them with a thin coat of light oil and wrap them in a lint-free cloth or waxed paper.

(5) Inspect the gear and worm for cracked or broken teeth and worn keyways. Replace the gear and worm, as a set, if either one has cracked or broken teeth.

1. Screw, cap, hex hd (8)
2. Cap, closed, high speed
3. Gasket, cap
4. Bearing, cone and cup, high speed (2)
5. Key
6. Fitting, grease
7. Plug, pipe, vented
8. Cover, closed
9. Gasket, cover, low speed
10. Bearing, cone and cup, low speed
11. Shaft, low speed
12. Gear, special Q 12 1/3
13. Pin
14. Spacer, low speed
15. Case, reducer
16. Shaft, worm, special Q 12 1/3
17. Gasket, cap
18. Cap, open, high speed
19. Seal, oil, high speed
20. Seal, oil, low speed (2)
21. Plug, pipe, solid (2)



TS 4610-221-34/3-54

Figure 3-54. Erdlator Agitator Gear Assembly, Exploded View

(6) Inspect the shafts for damaged threads, worn keyways, misalignment, and cracks. Replace the shafts if they are bent or if the keyways or threads are worn.

(7) Inspect the housing, side covers, and bearing adapter for cracks and other damage. Replace the housing and covers if the threads cannot be restored or if the part is cracked or broken.

(8) Replace all unserviceable mounting hardware.

(9) Replace all gaskets.

e. Reassembly.

(1) Install the oil seals (19, fig. 3-54) into cap (18), pipe plugs (21), and oil seals (20).

(2) Install key (5) into shaft (11) and side gear (12) onto the shaft. Install pin (13) into the gear.

(3) Install the spacer (14) and the cone bearing and cup (10) onto shaft (11).

(4) Install the shaft assembly (11) into the case.

(5) Install the shaft (16) into the case (15).

(6) Install the cone bearings and cups (4) onto both ends of shaft (16).

(7) Install gaskets (17, 3 and 9) onto the case.

(8) Install cover (8) and caps (18 and 2) onto the case and secure cover and caps with screws (1).

f. Installation.

(1) Install half of the flexible coupling (2, fig. 3-36) and the machine key on the gear assembly input shaft (16) and secure with a setscrew.

(2) Install the cover on the flexible coupling (2).

(3) Install the flexible coupling (14) on the erdlator agitator shaft (13) and secure with one setscrew (9).

(4) Install the two mounting brackets (15) and secure with the four nuts (8), lockwashers, and capscrews (12).

(5) Position the erdlator agitator gear assembly (1) on the mounting brackets (15) inserting the gear assembly output shaft into the flexible coupling (14).

(6) Secure the gear assembly output shaft to the flexible coupling (14) with the other setscrew.

(7) Secure the erdlator agitator gear assembly (1) to the mounting brackets (15) with the four nuts (8), lockwashers and capscrews (12).

(8) Position the flexible coupling chain (3) over the two halves of the flexible coupling (2) and secure the flexible coupling chain together with the master link.

(9) Install the cover on the flexible coupling (14).

3-18. Downcomer Tube.

a. Removal.

(1) Remove the agitator (para 3-16).

(2) Remove the four nuts (5, fig. 3-42), lockwashers (4), and screws (6) and remove the downcomer tube (7) from the erdlator tank through the roof hatch.

b. Cleaning, Inspection, and Repair.

WARNING

Drycleaning solvent, P-D-680, used to clean parts is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Do not use near open flame or excessive heat. Flash point of solvent is 100 degrees F - 138 degrees F (38 degrees C - 59 degrees C).

(1) Clean all parts in cleaning solvent (item 1, App. C).

(2) Inspect the downcomer tube for cracks, dents, and pitted spots.

(3) Repair cracks and straighten dents. Replace an unserviceable downcomer tube.

c. Installation.

(1) Insert the downcomer tube into the erdlator tank through the roof hatch and secure with the four screws (6, fig. 3-42), lockwashers (4), and nuts (5).

(2) Install the agitator (para 3-16).

Section V. PUMPS (EXCLUDING ENGINE PUMPS)

3-19. Filter Pump Assembly.

a. Removal.

(1) Disconnect the electrical cable (6, fig. 3-55) from the junction box (4).

(2) Remove the four nuts (8, fig. 3-56), lockwashers (7), and capscrews (5) that secure the companion flange (6) to the filter pump assembly (26).

(3) Disconnect the pipe union (1) and remove, as an assembly, the section of coagulated water piping that consists of half the pipe union (1), nipple (2), control valve (3), nipple (4), and companion flange (6).

(4) Remove the other four capscrews (5), nuts (8), and lockwashers (7) that secure the companion flange (9) to the filter pump assembly (26).

(5) Disconnect the pipe union (19) and remove as an assembly the section of coagulated water piping consisting of half the pipe union (19), pipe nipple (18), check valve (12), pipe nipple (11), elbow (10), and flange companion (9).

(6) Remove the four capscrews (21) and washers (22) and lift the filter pump assembly (26) and motor assembly (20), as an assembly, from the two brackets (23 and 25).

(7) Remove the setscrew (18, fig. 3-57) that secures the impeller shaft (7) to the drive shaft of the motor assembly (20, fig. 3-56).

(8) Remove the four capscrews (27) and separate the filter pump assembly (26) from the motor assembly (20). Remove the key that locks the drive shaft of the motor assembly to the impeller shaft of the filter pump assembly.

b. Disassembly.

(1) Remove the six capscrews (14, fig. 3-57) and separate the suction head (1) from the pump casing (10).

(2) Remove the gasket (2) and wear ring (3) from the suction head (1).

(3) Remove the other four capscrews (14) and separate the intermediate adapter (15) from the pump casing (10).

(4) Remove the deflector (13) from the impeller shaft (7).

(5) Remove the two bolts (16) and remove the gland (12) and gasket (11) from the pump casing (10).

(6) Remove the impeller (6) and impeller shaft (7) as an assembly from the pump casing. Remove the pump seal assembly (8) from the pump casing.

(7) Remove the nut (4) and lockwasher (5) and separate the impeller (6) from the impeller shaft (7). Remove the machine key (19) from the impeller shaft.

(8) Remove the pipe plug (9) and draincock (17) from the pump casing (10).

c. Cleaning, Inspection, and Repair.

WARNING

Drycleaning solvent, P-D-680, used to clean parts is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Do not use near open flame or excessive heat. Flash point of solvent is 100 degrees F - 138 degrees F (38 degrees C - 59 degrees C).

(1) Clean all metal parts of the filter pump assembly with cleaning solvent (item 1, App. C). A wire brush may be used to aid removal of chemical scale.

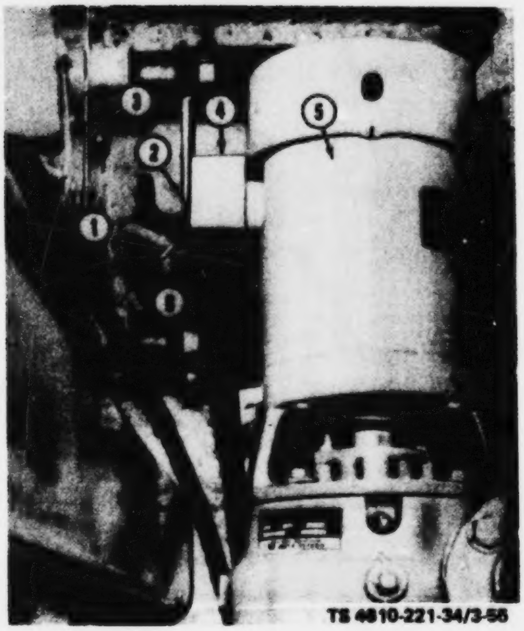
(2) Clean the pump seal assembly with a soap and water solution. Rinse the seal in clear water and dry thoroughly.

(3) Inspect the suction head, pump casing, and intermediate adapter for cracks, breaks, and damaged threads. Remove burrs and scratches from the machined mating surfaces and replace if otherwise unserviceable.

(4) Inspect the wear ring and impeller for cracks, breaks, and excessive wear. Replace a defective wear ring or impeller.

(5) Inspect the impeller shaft for a distorted keyway, damaged threads, and excessive wear around the seal and gland mating surfaces. Replace a defective impeller shaft.

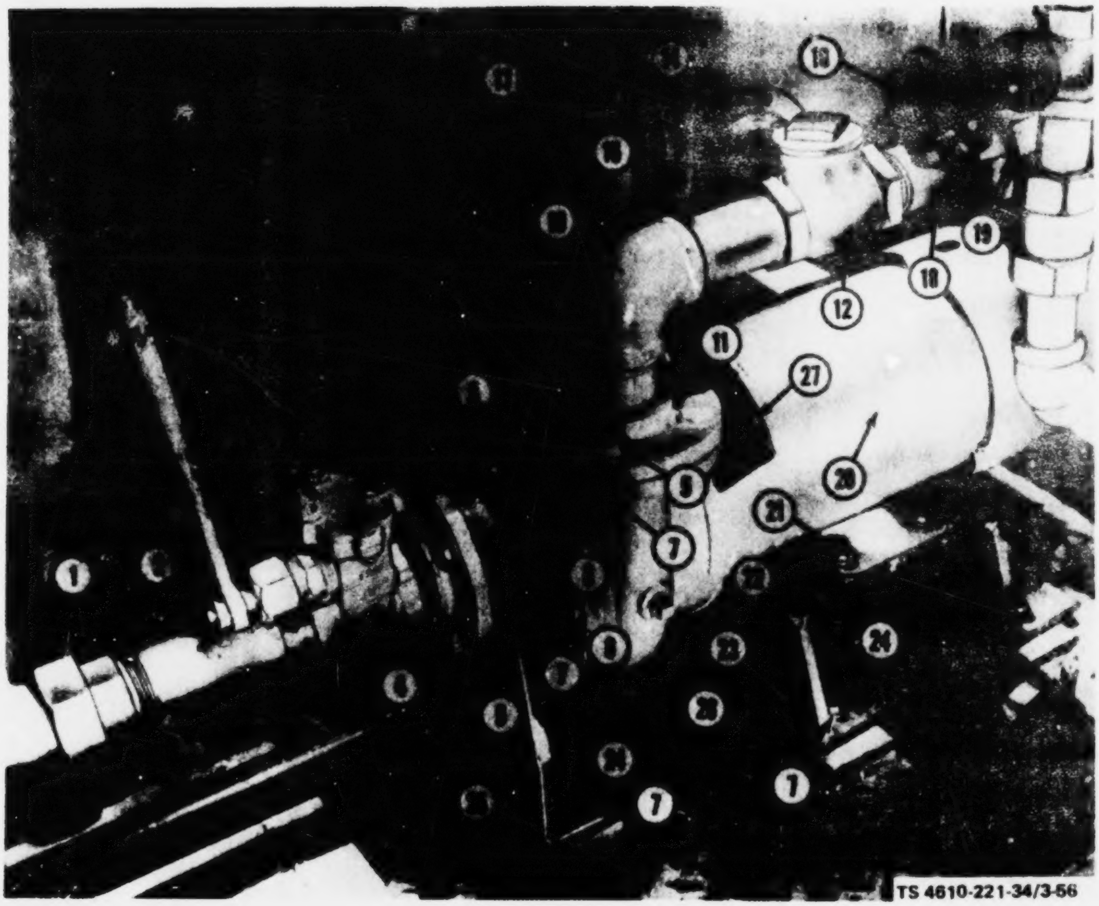
(6) Inspect the pump seal assembly for a weak or broken spring, marred or defaced sur-



TS 4610-221-34/3-55

1. Wire nut (3)
2. Screw
3. Cover
4. Junction box
5. Filter pump motor
6. Cable

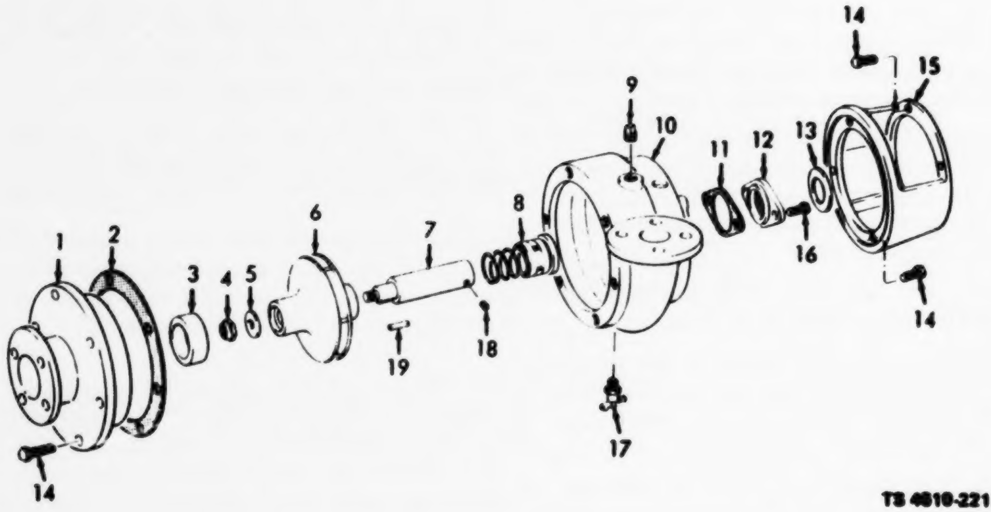
Figure 3-55. Filter Pump Electrical Cable. Removal



TS 4610-221-34/3-56

1. Union, pipe, 1 1/2 in.
2. Nipple, pipe, 1 1/2 x 6 in.
3. Control valve
4. Nipple, pipe, 1 1/2 in.
5. Screw, cap, hex hd, 1/2-13 x 2 in. (8)
6. Companion flange, 1 1/2 in.
7. Lockwasher, 3/8 in. (14)
8. Nut hex, 1/2-13 (14)
9. Companion flange, 1 1/4 in.
10. Elbow, pipe, 1 1/4 in.
11. Nipple, pipe, 1 1/4 in.
12. Check valve, 1 1/4 in.
13. Oval molding
14. Screw, sheet metal, No. 10 x 1 in. (6)
15. Canvas cover
16. Control valve CV-37
17. Van body
18. Nipple, pipe, 1 1/4 x 2 in.
19. Union, pipe, 1 1/4 in.
20. Motor assembly
21. Screw, cap, hex hd, 3/8-16 x 1 3/4 in. (4)
22. Washer, flat, 3/8 in. (4)
23. Bracket
24. Screw, cap, hex hd, 3/8-16 x 6 1/2 in. (6)
25. Bracket
26. Filter pump assembly
27. Screw, cap, hex hd, 3/8-16 x 7/8 in. (4)

Figure 3-56. Filter Pump and Motor Assemblies, Removal



TS 4610-221-34/3-57

1. Suction head
2. Gasket
3. Wear ring
4. Nut, self-locking, 1/4-20
5. Lockwasher (spec)
6. Impeller
7. Impeller shaft
8. Pump seal assembly
9. Plug, pipe, 1/4 in.
10. Pump casing
11. Gasket
12. Gland
13. Deflector
14. Screw, cap, hex hd, 3/8-16 x 7/8 in. (14)
15. Intermediate adapter
16. Bolt, machine, 5/16-18 x 3/4 in. (2)
17. Draincock, 1/4-in.
18. Setscrew, hex socket, 1/4-29 x 1/4 in.
19. Key, machine, 3/16 x 1 1/2 in.

Figure 3-57. Filter Pump Assembly, Exploded View

faces of the seal, and for a damaged bellows. Replace the pump seal assembly if damaged or defective.

(7) Inspect the gland for cracks, breaks, and indications of water leaks. Replace a defective gland.

d. Reassembly.

(1) Install the pipe plug (9, fig. 3-57) and draincock (17) in the pump casing (10).

(2) Install the machine key (19) in the impeller shaft (7). Install the impeller (6) on the impeller shaft (7), aligning it on the machine key. Be sure the impeller hub is flush against the shoulder of the impeller shaft.

(3) Secure the impeller (6) to the impeller shaft (7) with the lockwasher (5) and nut (4).

(4) Coat the mating surfaces of the pump seal assembly (8) and pump casing (10) with white lead and install the pump seal assembly in the pump casing.

(5) Insert the impeller shaft (7), with attached impeller (6), through the pump seal assembly (8) in the pump casing.

(6) Install the gasket (11) and gland (12) over the end of the impeller shaft and secure the gland to the pump casing with the two bolts (16).

(7) Install the deflector (13) on the end of the impeller shaft.

(8) Position the intermediate adapter (15) on the pump casing (10) and secure with the four capscrews (14).

(9) Install the wear ring (3) in the suction head (1).

(10) Position the gasket (2) and suction head (1) on the pump casing (10) and secure with the six capscrews (14).

e. Installation.

(1) Install the machine key in the drive shaft of the motor assembly.

(2) Position the motor assembly (20, fig. 3-56) on the filter pump assembly (26), inserting the drive shaft of the motor assembly into th impeller shaft of the filter pump assembly. Secure the filter pump assembly to the motor assembly with the four capscrews (27).

(3) Secure the drive shaft of the motor assembly (20) to the impeller shaft (7, fig. 3-57) of the filter pump assembly with the setscrew (18).

(4) Install the filter pump assembly (26, fig. 3-56) with attached motor assembly (20), on the two brackets (23 and 25) and secure with the four capscrews (21) and washers (22).

(5) Install the section of coagulated water piping consisting of half of the pipe union (19), pipe nipple (18), check valve (12), pipe nipple (11), elbow (10), and companion flange (9) on the discharge side of the filter pump assembly and connect the pipe union (19).

(6) Secure the companion flange (9) to the filter pump assembly (26) with four nuts (8) lockwashers (7), and capscrews (5).

(7) Install the section of coagulated water piping that consists of half of the pipe union (1), nipple (2), control valve (3), nipple (4), and companion flange (6) to the suction side of the filter pump assembly and connect the pipe union (1).

(8) Secure the companion flange (6) to the filter pump assembly (26) with the four nuts (8), lockwashers (7), and capscrews (5).

(9) Connect the electrical cable (6, fig. 3-55) to the junction box (4).

Section VI. FIREFIGHTING EQUIPMENT

3-20. Fire Extinguisher.

a. Carbon Dioxide Type.

(1) Description. The carbon dioxide type fire extinguisher is suitable for electrical and flammable liquid fires. The carbon dioxide types are in 4 pound (1.8 kg), 7 1/2 pound (3.4 kg), and 10 pound (4.5 kg) sizes. The 4 pound (1.8 kg) extinguisher is portable; the other two are fixed type.

(2) Maintenance. For maintenance of the fire extinguisher, refer to TM 5-687.

b. Monobromotrifluoromethane Type.

(1) Description. The monobromotrifluoromethane type fire extinguisher is generally suitable for all types of fire, except fires involved with LOX (liquid oxygen) generating equipment. The fire extinguisher is furnished with a disposable type cylinder.

(2) Replacement of Cylinder. To replace cylinder, perform the following:

(a) Press lever to release pressure from used cylinder.

(b) Loosen swivel valve coupling nut and remove valve assembly from used cylinder.

(c) Remove instruction band from used cylinder.

(d) Place new cylinder through instruction band.

(e) Replace safety pin in valve and seal pin with sealing wire.

(f) Attach valve assembly and tighten swivel coupling nut on the new cylinder and place fire extinguisher in mounting bracket.

(g) Adjust instruction band on cylinder to show maintenance and operating instructions.

(3) Maintenance. Weigh fire extinguisher every three months and replace cylinder if gross weight has decreased four ounces (113 grams) or more. Lubricate cylinder neck threads with one drop of OE30 oil before reassembly.

Section VII. ACCESSORY ITEMS

3-21. Personnel Heater. Refer to TM 5-4520-227-14 for maintenance of the Hunter Model UH-68-4 heater.

APPENDIX A

REFERENCES

A-1. Fire Protection.

TB 5-4200-200-10	Hand Portable Fire Extinguishers Approved for Army Users

A-2. Lubrication.

69100IL	Fuels, Lubricants, Oils, and Waxes
LO 5-4610-221-12	Water Purification Unit: Van Type Body Mounted, Electric Driven, AC, 115/208V, Single and 3 Phase, 60 Cycle 1/20 to 2HP; 1500 GHP (MET-PRO Model 1500-2600A)
LO 9-2320-209-12	Lubrication Order: Truck, 2 1/2 Ton, 6 x 6 Cargo M34, M35, M36 Chassis M44, M45, M46, M57, M58 Dump M47, M59 Wrecker M60, M108 Series. Van M109.
TB 703-1	Specification List of Standard Liquid Fuels, Lubricants, Preservatives, and Related Products Authorized for Use by U.S. Army.

A-3. Painting.

AR 746-1	Color, Marking, and Preparation of Equipment for Shipment

A-4. Maintenance.

FM 29-2	Organizational Maintenance Management
TM 9-207	Operation and Maintenance of Ordnance Materiel in Cold Weather (0 to 65 degrees F)
TB 750-651	Use of Antifreeze Solutions for Cleaning Compounds in Engine Cooling Systems
TM 5-764	Electric Motor and Generator Repair
TM 9-2610-200-20	Organizational Care, Maintenance, and Repair of Pneumatic Tires and Inner Tubes
TM 9-6140-200-14	Operator, Organizational, Direct Support and General Support Maintenance Manual: Storage Batteries: Lead-Acid Type
TM 11-483	Radio Interference Suppression
TM 750-254	Cooling System, Tactical Vehicles
TM 5-4610-221-20P	Organizational Maintenance Repair Parts and Special Tools Lists: Water Purification Unit; MET-PRO Model 1500-2600A
TM 5-4610-221-35P	Direct and General Support and Depot Maintenance Repair Parts and Special Tools List: Water Purification Unit, MET-PRO Model 1500-2600A

TM 5-4620-227-14	Maintenance and Repair Parts for Hunter Heaters
TM 9-2320-209-10	Operator's Manual for 2 1/2 Ton, 6 x 6, Chassis, Truck M44, M45, M46, M47, M58 Dump M47, M59, M567, M60, M108 and M109 Series
TM 5-660	Operation of Water Supply, and Treatment Facilities at Fixed Army Installations
TM 5-700	Field Water Supply

A-5. Shipment and Storage.

TB 740-97-2	Preservation of USAMECOM Mechanical Equipment for Shipment and Storage
TM 740-90-1	Administrative Storage of Equipment

A-6. Demoltion.

TM 750-244-3	Procedures for Destruction of Equipment to Prevent Enemy Use (Mobility Equipment Command)

APPENDIX B

REPAIR PARTS AND SPECIAL TOOLS LIST

Repair parts and special tools for direct and general support maintenance are listed and illustrated in TM 5-4610-221-34P. Repair parts for Hunter heaters are listed in TM 5-4520-227-14.

APPENDIX C

EXPENDABLE SUPPLIES AND MATERIALS LIST

Section I. INTRODUCTION

C-1. Scope. This appendix lists expendable supplies and materials you will need to operate and maintain the water purification unit. These items are authorized to you by CTA 50-970, Expendable Items (Except Medical, Class V, Repair Parts, and Heraldic Items).

C-2. Explanation of Columns.

a. Column 1 - Item Number. This number is assigned to the entry in the listing and is referenced in the narrative instructions to identify the material (e.g., "Use cleaning compound, item 1, App. C").

b. Column 2 - Level. This column identifies the lowest level of maintenance that requires the listed item.

(enter as applicable)

C	Operator/Crew
O	Organizational Maintenance
F	Direct Support Maintenance
H	General Support Maintenance

c. Column 3 - National Stock Number. This is the National stock number assigned to the item; use it to request or requisition the item.

d. Column 4 - Description. Indicates the Federal item name and, if required, a description to identify the item. The last line for each item indicates the part number followed by the Federal Supply Code for Manufacturer (FSCM) in parentheses, if applicable.

e. Column 5 - Unit of Measure (U/M). Indicates the measure used in performing the actual maintenance function. This measure is expressed by a two-character alphabetical abbreviation (e.g., ea, in, pr). If the unit of measure differs from the unit of issue, requisition the lowest unit of issue that will satisfy your requirements.

Section II

EXPENDABLE SUPPLIES AND MATERIALS LIST

(1) Item Number	(2) Level	(3) National Stock Number	(4) Description	(5) U/M
1	F		Cleaning Solvent (P-D-680)	ga
2	F		Denatured Alcohol (MIL-STD-1201)	ga
3	F		Nonmineral Cleaning Solvent	ga
4	F		Sandpaper (000)	bx

Charts Transposed to

End of Volume.

By Order of the Secretary of the Army:

E. C. MEYER
General, United States Army
Chief of Staff

Official:

J. C. PENNINGTON
Major General, United States Army
The Adjutant General

DISTRIBUTION:
To be distributed in accordance with DA Form 12-25A, Direct and General Support Maintenance requirements for Water Purification.

☆ U.S. GOVERNMENT PRINTING OFFICE : 1989 O - 242-451/5065

RECOMMENDED CHANGES TO EQUIPMENT TECHNICAL MANUALS

SOMETHING WRONG WITH THIS MANUAL?

THEN. . .JOT DOWN THE DOPE ABOUT IT ON THIS FORM, TEAR IT OUT, FOLD IT AND DROP IT IN THE MAIL!

FROM: (YOUR UNIT'S COMPLETE ADDRESS)
PFC JOHN DOE
CO A, 3d ENGINEER BN
FT. LEONARD WOOD MO 63108

DATE

PUBLICATION NUMBER	DATE	TITLE
TM 5-4610-221-34	21 Dec 79	Water Purification Unit Van-Type Body Mounted

BE EXACT. . .PIN-POINT WHERE IT IS

PAGE NO.	PARAGRAPH	FIGURE NO.	TABLE NO.	IN THIS SPACE TELL WHAT IS WRONG AND WHAT SHOULD BE DONE ABOUT IT:
6	2-1 a			In line 6 of paragraph 2-1a the manual states the engine has 6 cylinders. The engine on my set only has 4 cylinders. Change the manual to show 4 cylinders.
81		4-3		Callout 16 on figure 4-3 is pointing at a bolt. In the key to fig. 4-3, item 16 is called a shim. Please correct one or the other.
125	line 20			I ordered a gasket, item 19 on figure B-16 by NSN 2910-00-762-3001. I got a gaskett but it doesn't fit. Supply says I got what I ordered so the NSN is wrong. Please give me a good NSN.

SAMPLE

TEAR ALONG DOTTED LINE

TYPED NAME, GRADE OR TITLE, AND TELEPHONE NUMBER	SIGN HERE:
JOHN DOE, PFC (268) 317-7111	John Doe

DA FORM 1 AUG 74 2028-2

P.S.--IF YOUR OUTFIT WANTS TO KNOW ABOUT YOUR MANUAL "FIND," MAKE A CARBON COPY OF THIS AND GIVE IT TO YOUR HEADQUARTERS.

DRSTS-M Overprint 1, 1 Nov 78

FILL IN YOUR
UNIT'S ADDRESS

FOLD BACK

EPARTMENT OF THE ARMY

OFFICIAL BUSINESS
PENALTY FOR PRIVATE USE, $300

Commander
US Army Troop Support and Aviation
Materiel Readiness Command
ATTN: DRSTS-MTPS
4300 Goodfellow Boulevard
St. Louis, MO 63120

TEAR ALONG DOTTED LINE

FOLD BACK

REVERSE OF DA FORM 2028-2

RECOMMENDED CHANGES TO EQUIPMENT TECHNICAL MANUALS

SOMETHING WRONG WITH THIS MANUAL?

THEN. . .JOT DOWN THE DOPE ABOUT IT ON THIS FORM, TEAR IT OUT, FOLD IT AND DROP IT IN THE MAIL!

FROM: (YOUR UNIT'S COMPLETE ADDRESS)

DATE

PUBLICATION NUMBER TM 5-4610-221-34

DATE 21 Dec 79

TITLE Water Purification Unit Van-Type Body Mounted

BE EXACT. . .PIN-POINT WHERE IT IS				IN THIS SPACE TELL WHAT IS WRONG AND WHAT SHOULD BE DONE ABOUT IT:
PAGE NO.	PARA-GRAPH	FIGURE NO.	TABLE NO.	

TYPED NAME, GRADE OR TITLE, AND TELEPHONE NUMBER

SIGN HERE:

DA FORM 1 AUG 74 2028-2

P.S.--IF YOUR OUTFIT WANTS TO KNOW ABOUT YOUR MANUAL "FIND," MAKE A CARBON COPY OF THIS AND GIVE IT TO YOUR HEADQUARTERS.

TEAR ALONG DOTTED LINE

FILL IN YOUR
UNIT'S ADDRESS

FOLD BACK

DEPARTMENT OF THE ARMY

____

____

OFFICIAL BUSINESS
PENALTY FOR PRIVATE USE, $300

Commander:
U.S. Army Support and Aviation
Material Readiness Command
ATTN: DRSTS-MTPS
4300 Goodfellow Boulevard
St. Louis, Mo. 63120

FOLD BACK

RECOMMENDED CHANGES TO EQUIPMENT TECHNICAL MANUALS

THEN. . .JOT DOWN THE DOPE ABOUT IT ON THIS FORM, TEAR IT OUT, FOLD IT AND DROP IT IN THE MAIL!

SOMETHING WRONG WITH THIS MANUAL?

FROM: (YOUR UNIT'S COMPLETE ADDRESS)

DATE

PUBLICATION NUMBER TM 5-4610-221-34

DATE 21 Dec 79

TITLE Water Purification Unit Van-Type Body Mounted

BE EXACT. . .PIN-POINT WHERE IT IS				IN THIS SPACE TELL WHAT IS WRONG AND WHAT SHOULD BE DONE ABOUT IT:
PAGE NO.	PARA-GRAPH	FIGURE NO.	TABLE NO.	

TYPED NAME, GRADE OR TITLE, AND TELEPHONE NUMBER

SIGN HERE:

TEAR ALONG DOTTED LINE

DA FORM 1 AUG 74 2028-2

P.S.--IF YOUR OUTFIT WANTS TO KNOW ABOUT YOUR MANUAL "FIND," MAKE A CARBON COPY OF THIS AND GIVE IT TO YOUR HEADQUARTERS.

FILL IN YOUR
UNIT'S ADDRESS

FOLD BACK

DEPARTMENT OF THE ARMY

____

____

OFFICIAL BUSINESS

PENALTY FOR PRIVATE USE, $300

Commander:
U.S. Army Support and Aviation
Material Readiness Command
ATTN: DRSTS-MTPS
4300 Goodfellow Boulevard
St. Louis, Mo. 63120

TEAR ALONG DOTTED LINE

FOLD BACK

RECOMMENDED CHANGES TO EQUIPMENT TECHNICAL MANUALS

THEN. . .JOT DOWN THE DOPE ABOUT IT ON THIS FORM, TEAR IT OUT, FOLD IT AND DROP IT IN THE MAIL!

SOMETHING WRONG WITH THIS MANUAL?

FROM: (YOUR UNIT'S COMPLETE ADDRESS)

DATE

PUBLICATION NUMBER	DATE	TITLE
TM 5-4610-221-34	21 Dec 79	Water Purification Unit Van-Type Body Mounted

BE EXACT. . .PIN-POINT WHERE IT IS

PAGE NO.	PARAGRAPH	FIGURE NO.	TABLE NO.	IN THIS SPACE TELL WHAT IS WRONG AND WHAT SHOULD BE DONE ABOUT IT:

TYPED NAME, GRADE OR TITLE, AND TELEPHONE NUMBER

SIGN HERE:

TEAR ALONG DOTTED LINE

DA FORM 1 AUG 74 2028-2

P.S.--IF YOUR OUTFIT WANTS TO KNOW ABOUT YOUR MANUAL "FIND," MAKE A CARBON COPY OF THIS AND GIVE IT TO YOUR HEADQUARTERS.

FILL IN YOUR
UNIT'S ADDRESS

FOLD BACK

DEPARTMENT OF THE ARMY

____

____

OFFICIAL BUSINESS

PENALTY FOR PRIVATE USE, $300

Commander:
U.S. Army Support and Aviation
Material Readiness Command
ATTN: DRSTS-MTPS
4300 Goodfellow Boulevard
St. Louis, Mo. 63120

FOLD BACK

The Metric System and Equivalents

Linear Measure

1 centimeter = 10 millimeters = . 39 inch
decimenter = 10 centimeters = 3.94 inches
1 meter = 10 decimeters = 39.37 inches
1 dekameter = 10 meters = 32.8 feet
1 hectometer = 10 dekameters = 328.08 feet
1 kilometer = 10 hectometers = 3,280.8 feet

Weights

1 centigram = 10 milligrams = . 15 grain
1 decigram = 10 centigrams = 1.54 grains
1 gram = 10 decigrams = . 035 ounce
1 dekagram = 10 grams = . 35 ounce
1 hectogram = 10 dekagrams = 3.52 ounces
1 kilogram = 10 hectograms = 2.2 pounds
1 quintal = 100 kilograms = 220.46 pounds
1 metric ton = 10 quintals = 1.1 short tons

Liquid Measure

1 centiliter = 10 milliters = . 34 fl. ounce
1 deciliter = 10 centiliters = 3.38 fl. ounces
1 liter = 10 deciliters = 38.82 fl. ounces
1 dekaliter = 10 liters = 2.64 gallons
1 hectoliter = 10 dekaliters = 26.42 gallons
1 kiloliter = 10 hectoliters = 264.18 gallons

Square Measure

1 sq. centimeter = 100 sq. millimeters = . 155 sq. inch
1 sq. decimenter = 100 sq. centimeters = 15.5 sq. inches
1 sq. meter (centare) = 100 sq. decimeters = 10.76 sq. feet
1 sq. dekameter (are) = 100 sq. meters = 1,076.4 sq. feet
1 sq. hectometer (hectare) = 100 sq. dekameters = 2.47 acres
1 sq. kilometer = 100 sq. hectometers = . 386 sq. mile

Cubic Measure

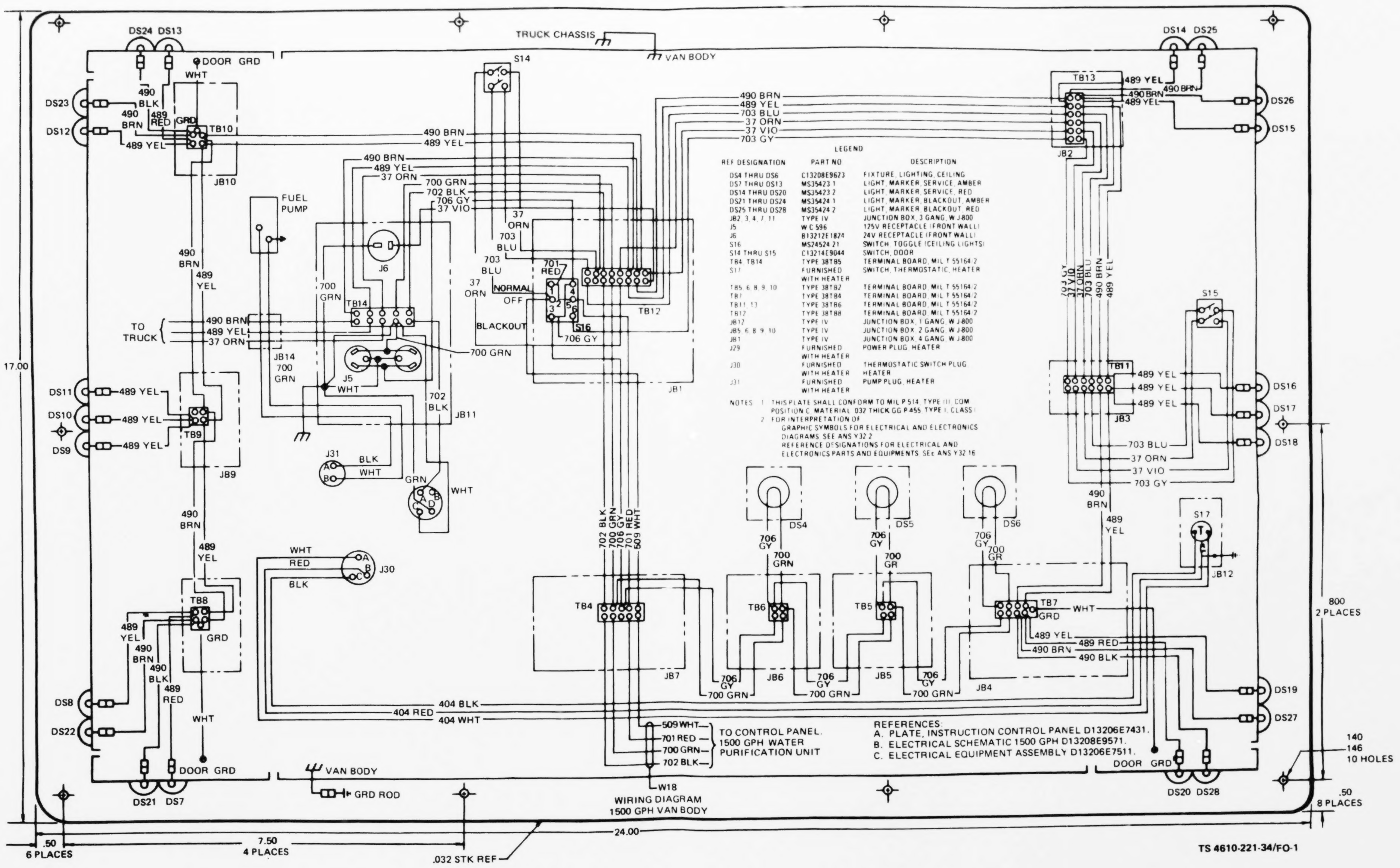
1 cu. centimeter = 1000 cu. millimeters = . 06 cu. inch
1 cu. decimeter = 1000 cu. centimeters = 61.02 cu. inches
1 cu meter = 1000 cu. decimeters = 35.31 cu. feet

Approximate Conversion Factors

To change	*To*	*Multiply by*	*To change*	*To*	*Multiply by*
inches	centimeters	2.540	ounce-inches	newton-meters	.007062
feet	meters	.305	centimeters	inches	.394
yards	meters	.914	meters	feet	3.280
miles	kilometers	1.609	meters	yards	1.094
square inches	square centimeters	6.451	kilometers	miles	.621
square feet	square meters	.093	square centimeters	square inches	.155
square yards	square meters	.836	square meters	square feet	10.764
square miles	square kilometers	2.590	square meters	square yards	1.196
acres	square hectometers	.405	square kilometers	square miles	.386
cubic feet	cubic meters	.028	square hectometers	acres	2.471
cubic yards	cubic meters	.765	cubic meters	cubic feet	35.315
fluid ounces	milliliters	29,573	cubic meters	cubic yards	1.308
pints	liters	.473	milliliters	fluid ounces	.034
quarts	liters	.946	liters	pints	2.113
gallons	liters	3.785	liters	quarts	1.057
ounces	grams	28.349	liters	gallons	.264
pounds	kilograms	.454	grams	ounces	.035
short tons	metric tons	.907	kilograms	pounds	2.205
pound-feet	newton-meters	1.365	metric tons	short tons	1.102
pound-inches	newton-meters	.11375			

Temperature (Exact)

°F	Fahrenheit temperature	5/9 (after subtracting 32)	Celsius temperature	°C


TRUCK CHASSIS
VAN BODY
DS24
DS13
DOOR GRD
WHT
S14
DS14
DS25
DS23
DS12
490 BLK
489 RED
490 BRN
489 YEL
GRD
TB10
JB10
490 BRN
489 YEL
703 BLU
37 ORN
37 VIO
703 GY
TB13
JB2
DS26
DS15
FUEL PUMP
700 GRN
702 BLK
706 GY
37 VIO
J6
37 ORN
703 BLU
701 RED
NORMAL
OFF
BLACKOUT
S16
TB12
JB1
TO TRUCK
TB14
JB14
J5
WHT
JB11
DS11
DS10
DS9
TB9
JB9
J31
BLK
WHT
GRN
S15
TB11
JB3
DS16
DS17
DS18
DS4
DS5
DS6
706 GY
700 GRN
S17
JB12
J30
WHT
RED
BLK
TB8
TB4
TB6
TB5
TB7
JB7
JB6
JB5
JB4
DS8
DS22
404 BLK
404 RED
404 WHT
509 WHT
701 RED
700 GRN
702 BLK
TO CONTROL PANEL, 1500 GPH WATER PURIFICATION UNIT
W18
DS19
DS27
489 RED
490 BLK
DS21
DS7
DOOR GRD
VAN BODY
GRD ROD
DS20
DS28
17.00
24.00
.50 6 PLACES
7.50 4 PLACES
.032 STK REF
800 2 PLACES
140 146 10 HOLES
.50 8 PLACES
WIRING DIAGRAM 1500 GPH VAN BODY
TS 4610-221-34/FO-1

LEGEND

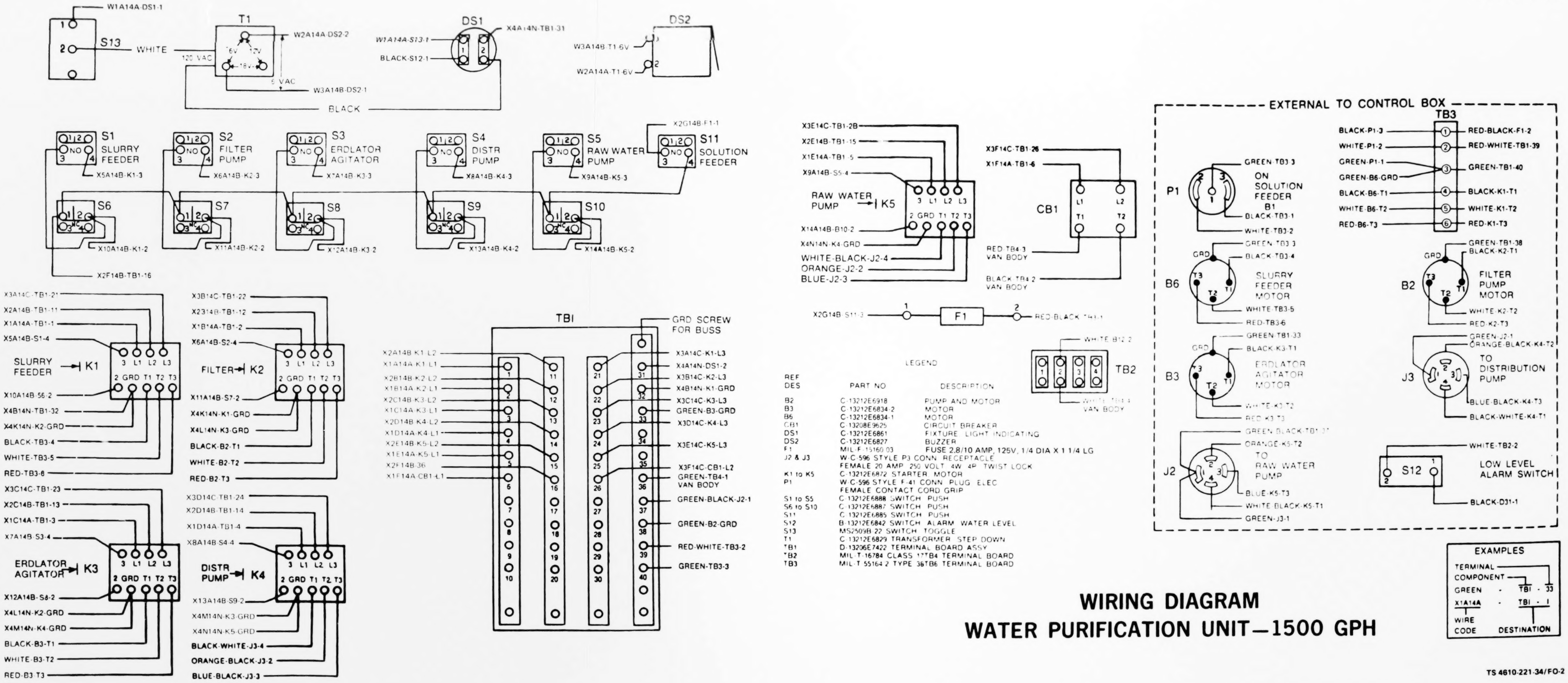
REF DESIGNATION	PART NO	DESCRIPTION
DS4 THRU DS6	C13208E9623	FIXTURE, LIGHTING, CEILING
DS7 THRU DS13	MS35423 1	LIGHT, MARKER, SERVICE, AMBER
DS14 THRU DS20	MS35423 2	LIGHT, MARKER, SERVICE, RED
DS21 THRU DS24	MS35424 1	LIGHT, MARKER, BLACKOUT, AMBER
DS25 THRU DS28	MS35424 2	LIGHT, MARKER, BLACKOUT, RED
JB2, 3, 4, 7, 11	TYPE IV	JUNCTION BOX, 3 GANG, W J-800
J5	W C 596	125V RECEPTACLE (FRONT WALL)
J6	B13212E1824	24V RECEPTACLE (FRONT WALL)
S16	MS24524 21	SWITCH, TOGGLE (CEILING LIGHTS)
S14 THRU S15	C13214E9044	SWITCH, DOOR
TB4, TB14	TYPE 38TB5	TERMINAL BOARD, MIL T 55164/2
S17	FURNISHED WITH HEATER	SWITCH, THERMOSTATIC, HEATER
TB5, 6, 8, 9, 10	TYPE 38TB2	TERMINAL BOARD, MIL T 55164/2
TB7	TYPE 38TB4	TERMINAL BOARD, MIL T 55164/2
TB11, 13	TYPE 38TB6	TERMINAL BOARD, MIL T 55164/2
TB12	TYPE 38TB8	TERMINAL BOARD, MIL T 55164/2
JB12	TYPE IV	JUNCTION BOX, 1 GANG, W J-800
JB5, 6, 8, 9, 10	TYPE IV	JUNCTION BOX, 2 GANG, W J-800
JB1	TYPE IV	JUNCTION BOX, 4 GANG, W J-800
J29	FURNISHED WITH HEATER	POWER PLUG, HEATER
J30	FURNISHED WITH HEATER	THERMOSTATIC SWITCH PLUG, HEATER
J31	FURNISHED WITH HEATER	PUMP PLUG, HEATER

NOTES:
1. THIS PLATE SHALL CONFORM TO MIL P 514, TYPE III, COMPOSITION C, MATERIAL .032 THICK GG P 455, TYPE I, CLASS I
2. FOR INTERPRETATION OF
   GRAPHIC SYMBOLS FOR ELECTRICAL AND ELECTRONICS DIAGRAMS, SEE ANS Y32 2
   REFERENCE DESIGNATIONS FOR ELECTRICAL AND ELECTRONICS PARTS AND EQUIPMENTS, SEE ANS Y32 16

REFERENCES:
A. PLATE, INSTRUCTION CONTROL PANEL D13206E7431.
B. ELECTRICAL SCHEMATIC 1500 GPH D13208E9571.
C. ELECTRICAL EQUIPMENT ASSEMBLY D13206E7511.

FO-1. *Van Body Wiring Diagram*

Reproduced from poor document.


W1A14A-DS1-1
S13
WHITE
T1
W2A14A-DS2-2
120 VAC
16V
12V
18V
5 VAC
W3A14B-DS2-1
BLACK
DS1
W1A14A-S13-1
BLACK-S12-1
X4A14N-TB1-31
DS2
W3A14B-T1-6V
W2A14A-T1-6V
S1 SLURRY FEEDER
S2 FILTER PUMP
S3 ERDLATOR AGITATOR
S4 DISTR PUMP
S5 RAW WATER PUMP
S11 SOLUTION FEEDER
X2G14B-F1-1
X5A14B-K1-3
X6A14B-K2-3
X7A14B-K3-3
X8A14B-K4-3
X9A14B-K5-3
S6
S7
S8
S9
S10
X10A14B-K1-2
X11A14B-K2-2
X12A14B-K3-2
X13A14B-K4-2
X14A14B-K5-2
X2F14B-TB1-16
X3A14C-TB1-21
X2A14B-TB1-11
X1A14A-TB1-1
X5A14B-S1-4
SLURRY FEEDER K1
X10A14B-S6-2
X4B14N-TB1-32
X4K14N-K2-GRD
BLACK-TB3-4
WHITE-TB3-5
RED-TB3-6
X3B14C-TB1-22
X2B14B-TB1-12
X1B14A-TB1-2
X6A14B-S2-4
FILTER K2
X11A14B-S7-2
X4K14N-K1-GRD
X4L14N-K3-GRD
BLACK-B2-T1
WHITE-B2-T2
RED-B2-T3
X3C14C-TB1-23
X2C14B-TB1-13
X1C14A-TB1-3
X7A14B-S3-4
ERDLATOR AGITATOR K3
X12A14B-S8-2
X4L14N-K2-GRD
X4M14N-K4-GRD
BLACK-B3-T1
WHITE-B3-T2
RED-B3-T3
X3D14C-TB1-24
X2D14B-TB1-14
X1D14A-TB1-4
X8A14B-S4-4
DISTR PUMP K4
X13A14B-S9-2
X4M14N-K3-GRD
X4N14N-K5-GRD
BLACK-WHITE-J3-4
ORANGE-BLACK-J3-2
BLUE-BLACK-J3-3
3 L1 L2 L3
2 GRD T1 T2 T3
TBI
GRD SCREW FOR BUSS
X2A14B-K1-L2
X1A14A-K1-L1
X2B14B-K2-L2
X1B14A-K2-L1
X2C14B-K3-L2
X1C14A-K3-L1
X2D14B-K4-L2
X1D14A-K4-L1
X2E14B-K5-L2
X1E14A-K5-L1
X2F14B-36
X1F14A-CB1-L1
X3A14C-K1-L3
X4A14N-DS1-2
X3B14C-K2-L3
X4B14N-K1-GRD
X3C14C-K3-L3
GREEN-B3-GRD
X3D14C-K4-L3
X3E14C-K5-L3
X3F14C-CB1-L2
GREEN-TB4-1 VAN BODY
GREEN-BLACK-J2-1
GREEN-B2-GRD
RED-WHITE-TB3-2
GREEN-TB3-3
X3E14C-TB1-28
X2E14B-TB1-15
X1E14A-TB1-5
X9A14B-S5-4
RAW WATER PUMP K5
X14A14B-B10-2
X4N14N-K4-GRD
WHITE-BLACK-J2-4
ORANGE-J2-2
BLUE-J2-3
X3F14C-TB1-26
X1F14A-TB1-6
CB1
L1 L2 T1 T2
RED-TB4-1 VAN BODY
BLACK-TB4-2 VAN BODY
X2G14B-S11-3
F1
RED-BLACK-TB3-1
WHITE-B12-2
TB2
WHITE-TB4-4 VAN BODY
EXTERNAL TO CONTROL BOX
TB3
BLACK-P1-3
WHITE-P1-2
GREEN-P1-1
GREEN-B6-GRD
BLACK-B6-T1
WHITE-B6-T2
RED-B6-T3
RED-BLACK-F1-2
RED-WHITE-TB1-39
GREEN-TB1-40
BLACK-K1-T1
WHITE-K1-T2
RED-K1-T3
P1
GREEN-TB3-3
ON SOLUTION FEEDER B1
BLACK-TB3-1
WHITE-TB3-2
B6
GREEN-TB3-3
BLACK-TB3-4
SLURRY FEEDER MOTOR
WHITE-TB3-5
RED-TB3-6
B2
GREEN-TB1-38
BLACK-K2-T1
FILTER PUMP MOTOR
WHITE-K2-T2
RED-K2-T3
B3
GREEN-TB1-33
BLACK-K3-T1
ERDLATOR AGITATOR MOTOR
WHITE-K3-T2
RED-K3-T3
J3
GREEN-J2-1
ORANGE-BLACK-K4-T2
TO DISTRIBUTION PUMP
BLUE-BLACK-K4-T3
BLACK-WHITE-K4-T1
J2
GREEN-BLACK-TB1-37
ORANGE-K5-T2
TO RAW WATER PUMP
BLUE-K5-T3
WHITE-BLACK-K5-T1
GREEN-J3-1
S12
WHITE-TB2-2
LOW LEVEL ALARM SWITCH
BLACK-DS1-1
GRD

LEGEND

REF DES	PART NO	DESCRIPTION
B2	C-13212E6918	PUMP AND MOTOR
B3	C-13212E6834-2	MOTOR
B6	C-13212E6834-1	MOTOR
CB1	C-13208E9625	CIRCUIT BREAKER
DS1	C-13212E6861	FIXTURE, LIGHT INDICATING
DS2	C-13212E6827	BUZZER
F1	MIL-F-15160 03	FUSE 2.8/10 AMP, 125V, 1/4 DIA X 1 1/4 LG
J2 & J3	W-C-596 STYLE P3 CONN RECEPTACLE FEMALE 20 AMP 250 VOLT 4W 4P TWIST LOCK	
K1 to K5	C-13212E6872 STARTER, MOTOR	
P1	W-C-596 STYLE F-41 CONN PLUG ELEC FEMALE CONTACT CORD GRIP	
S1 to S5	C-13212E6888 SWITCH PUSH	
S6 to S10	C-13212E6887 SWITCH PUSH	
S11	C-13212E6885 SWITCH PUSH	
S12	B-13212E6842 SWITCH ALARM WATER LEVEL	
S13	MS25098-22 SWITCH TOGGLE	
T1	C-13212E6829 TRANSFORMER STEP DOWN	
TB1	D-13206E7422 TERMINAL BOARD ASSY	
TB2	MIL-T-16784 CLASS 17TB4 TERMINAL BOARD	
TB3	MIL-T-55164-2 TYPE 36TB6 TERMINAL BOARD	

EXAMPLES

TERMINAL
COMPONENT
GREEN - TBI - 33
X1A14A - TBI - 1
WIRE CODE
DESTINATION

WIRING DIAGRAM
WATER PURIFICATION UNIT—1500 GPH

TS 4610-221-34/FO-2

FO-2. Control Cabinet Wiring Diagram

Reproduced from poor document.